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ABSTRACT

Developed as an aid to long-range planning at British Columbia Institute of Technology (BCIT), this third "Outlook" report presents information, analyses, and makes projections regarding conditions and trends likely to affect the college in the coming years. The report's six sections, which deal with important aspects of organizational life in British Columbia, focus on demography, the economy, the labor force, public policy, excellence in education, and the postsecondary educational system. Each of these sections identifies salient trends, comments on projections, and draws conclusions illustrating implications for BCIT planning. Highlighted conclusions included: (1) projections of a long-term decline in the conventional source population for full-time postsecondary education; (2) a medium-term economic outlook characterized by low inflation, high real interest rates, high unemployment, and slow growth; (3) low career placement levels for BCIT graduates in comparison to previous years; (4) the need to change the educational focus to one of lifelong learning to provide for the acquisition and upgrading of skills in response to technological advances; (5) a documented decline in the educational performance of elementary and secondary school students attributed to a lack of qualified teachers and inadequate instructional materials; and (6) a need for postsecondary institutions in British Columbia to seek new sources of funding as national and provincial policies of financial austerity continue. (HB)

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1984 OUTLOOK REPORT

Deborah Bannister

Craig Greenhill

DECEMBER, 1983

OFFICE OF INSTITUTIONAL PLANNING

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1964
1984 "looking to the future ... for 20 years"

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

BCIT

INTER OFFICE MEMO

5906 St-16

TO Gordon Thom
President

FROM Craig J. Greenhill
Director, Institute Planning

DATE 84:02:14
Project 1047

Re: 1984 Outlook Report

This third "Outlook" report examines recent trends in several areas external to the Institute which have significant implications for planning at BCIT. The 1984 report builds on the implications identified in earlier outlooks and reviews new data and analysis published at both national and provincial levels to draw conclusions with respect to BCIT.

I would be pleased to discuss any aspects of the report or its conclusions and to pursue any related questions which may arise. In particular, I would welcome suggestions which would enhance the usefulness of future editions of the Outlook.

Craig J. Greenhill

CGJ/ss

attachments

SUMMARY OF CONCLUSIONS

DEMOGRAPHY

1. The conventional source population for full-time post-secondary education (age 18-24) has begun a prolonged decline, the duration of which is projected to be at least 10 years. Rising participation in education, primarily attributable to high unemployment, may lessen or offset the impact on enrolment levels, but progressive declines can nonetheless be expected over the medium term.

2. Due to the current "echo baby boom" the post-secondary source population in British Columbia will reach an all-time high by the turn of the century.

3. The post-secondary source population and Grade XII enrolment are decreasing more rapidly in the Lower Mainland than in the balance of the province. This would indicate that greater provincial draw may be necessary to attain the desired enrolment levels at BCIT.

4. Full-time enrolment in provincial colleges and institutes reached an historical peak in 1983. Hereafter, system-wide declines are projected over the medium term. Intensified recruitment efforts and aggressive marketing may be necessary to maintain the current BCIT enrolment levels.

5. Despite recent decreases, part-time enrolment is projected to steadily increase over the medium term. Enhancement of part-time credit programs will enable BCIT to benefit substantially from these increases while weathering full-time enrolment declines.

6. As full-time participation by older age groups at BCIT has increased, so has participation by those most recently in the labour force. As long as umemployment rates remain high, this trend can be expected to continue.

7. Based on the results of a province-wide study of former career/ technical students, BCIT is the provincial institute of choice. This reputation should enable BCIT to offset substantial declines in enrolment, irrespective of system-wide decreases.

THE ECONOMY

1. By the first quarter of 1983, economic recovery was measurably evident, though primarily confined to strong gains in residential construction and in export demand. On the consumer level, recovery has been less conspicuous. Indicators are that the recovery will slowdown in the first half of 1984.

2. The medium term outlook for the Canadian economy is one of low inflation, high real interest rates, high unemployment, with the combined result of slow growth.

3. Recovery in British Columbia has been mixed and relatively sluggish. Much the same performance is forecast for 1984, with continuing modest improvement. Thereafter, a slowdown in economic activity is projected.

4. The primary forestry industry has registered substantial gains, with further, albeit slower, growth expected in 1984.

5. The mining sector has shown the worst performance and is not expected to show improvement in 1984.

6. The outlook for the retail sector is optimistic, but highly dependent upon consumer confidence. Performance to date has not kept pace with the national average.

7. Recovery in the tourism sector has been lagging, but the outlook for 1984 is one of moderate improvement. Real growth is not projected until the onset of Expo '86.

8. Historically, B.C. has exhibited some of the highest growth rates in the nation, capitalizing on its natural resource base. When world demand decreased radically, B.C.'s economy fell more rapidly than any other. Unless significant restructuring of the domestic economy occurs, a return to previous performance levels is unlikely.

THE LABOUR FORCE

1. The unemployment problem remains critical. Nationally, the annual unemployment rate is forecast to remain above 10% over the medium term.

2. B.C. has one of the highest regional unemployment levels in North America. The provincial annual unemployment rate is forecast to remain about 11% over the medium term.

3. Career placements for BCIT graduates will remain substantially below historical levels, given that one-fourth of those aged under 25 are out of work.

4. Employment in the primary resource sector will continue to fall behind other sectors. The potential for new job creation is expected to be in tourism, finance, secondary manufacturing, high technology, and non-government service industries. BCIT graduates should be in a more favourable position than most young job seekers, since they are being equipped with the skills required within these industries. A dynamic approach to curriculum content which anticipates technological advances will continue to produce graduates with marketable skills.

POLICY

1. Provincial government cut-backs in post-secondary education funding run counter to the federal government's goal of ensuring that post-secondary institutions have the capacity to respond to all reasonable demands for education. Though EPF funding was increased by 8% in

1983/84, the B.C. provincial government did not pass along the increase to the post-secondary system. This highlights the need for a mechanism of cooperation between the two levels of government for the purpose of coordinating policies and priorities, thereby determining the effective allocation of resources.

2. Due to the rapidity of technological advances, the focus of education must change to one of lifelong learning which provides for both the acquisition and the upgrading of skills appropriate to effective participation in working life.

3. Inherent to the national policy on technology development is technology's essential contribution to economic growth. Through joint ventures, such as Discovery Parks, the innovation and application of technology will not only be relevant to industry's needs, but also provide training in skills required by industry. BCIT's strong links with the private sector, combined with its reputation for excellence, emphasize the Institute's role in making available to British Columbians the opportunity to benefit from and participate in the technological future.

4. The 1983/84 provincial budget is essentially a response to two consecutive billion dollar deficits. The government contends that the taxpayer can no longer afford to support the size and cost of the public sector, resulting in cuts to health, human resources and education services. Whether in fact the restraint legislation results in private sector recovery has yet to be determined. Indications are that as long as the Social Credit party is in power, the public sector will experience continuing restraint. Educational institutions will have to depend less on government support and be more aggressive in seeking funds from private sources.

EXCELLENCE IN EDUCATION

1. There have been absolute declines in the educational performance of elementary and secondary school students both in Canada and the U.S.A. High school graduates are leaving school with an inadequate level of knowledge in science and technology. The basic causes have been attributed to the lack of qualified teachers, particularly in science, inadequate time spent teaching specialized subjects, and less than adequate instructional materials, including textbooks. Unless concerted action is taken to improve the educational process, students will not be equipped with the skills necessary to function in a technological-scientific age.

2. The lack of an adequate background in science among Grade 12 students in B.C. has functional implications for BCIT. If this trend continues, there will be fewer qualified applicants coming from secondary school. This could result in an increased demand for preparatory programs as well as higher attrition rates.

3. It has been said that no amount of post-secondary remediation will make up for poor foundations. On this basis, it is essential that those working in the higher education system assert the urgency of better student preparation with local school boards and the Ministry of Education.

THE POST-SECONDARY SYSTEM

1. The provincial government has made clear that its committment to restraint applies equally to post-secondary education as to other public services. Institutions will have to increasingly seek other sources of support, particularly in order to pursue new program initiatives.

2. The current proposal for formula funding could significantly reduce BCIT's allocation due to higher unit costs. Quality, as an essential component of productivity, should be incorporated as a formula factor. This would promote academic excellence, particularly in priority programs, while controlling unit cost.

3. BCIT is the only institution planning significant increases in enrolment in priority career technical programs over the next five years. Since demand already exceed capacity in these areas, it is doubtful that the educational needs of the province, particularly in technology-related programs, can be adequately met given the resources available. If further restraints are imposed (i.e. formula funding), the situation could become critical in the near future.

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INTRODUCTION

The identification of important trends or potential changes in the environment of the Institute is a vital part of planning. The purpose of this report is to bring together published information and analysis concerning several classes of variables in the environment and draw conclusions about their implications for B.C.I.T. It is intended as a reference document for long range planning in that it identifies opportunities which may be exploited and constraints which may require adjustment or efforts at avoidance. The report emphasizes trends, student body characteristics and possible demands in the general policy environment.

The Outlook Report is divided into six sections, each dealing with an important aspect of organizational life in British Columbia:

Demography
The Economy
Labour Force
Policy
Excellence in Education
Post-Secondary System

Each section identifies some salient trends, comments on projections and draws conclusions which illustrate the implications for B.C.I.T. planning.

DEMOGRAPHY

I. NATIONAL TRENDS

A. General[1]

Canada's population was estimated to have reached 25 million in November, 1983, exhibiting an average annual growth rate of 1.4%. This rate is consistent with that of the twenty year period 1961 to 1981. Between 1976 and 1981, the rural population increased at a higher rate (9%) than the urban population (5%). The number of live births dropped dramatically in the 1970's, diminishing the population of the younger age groups. At the current rate of aging, the median age of the Canadian population would approach 37 years by 2001. Though the aging trend is projected to continue, the rate is expected to slow due to a recent upturn in births. The female population is expected to maintain its slight majority over the male population, particular in the older age groups.

B. Trends in Education[2]

Demographic factors of particular relevance are those which impact the school age population. Between 1970-71 and 1980-81, Grade I enrolment fell by approximately 25% in Canada. During the same period, the population of 5 through 13 year olds decreased by 21%, while those aged 14 - 17 declined by 1.5% (Chart 1). Conversely, those aged 18 - 24 increased in population by 24% between 1971 and 1981, reaching an all-time high of 3.3 million. Based on the historic decrease in births, the 18 - 24 age group is beginning a prolonged decline in population. Increases in this age group are not projected to be realized until the turn of the century.

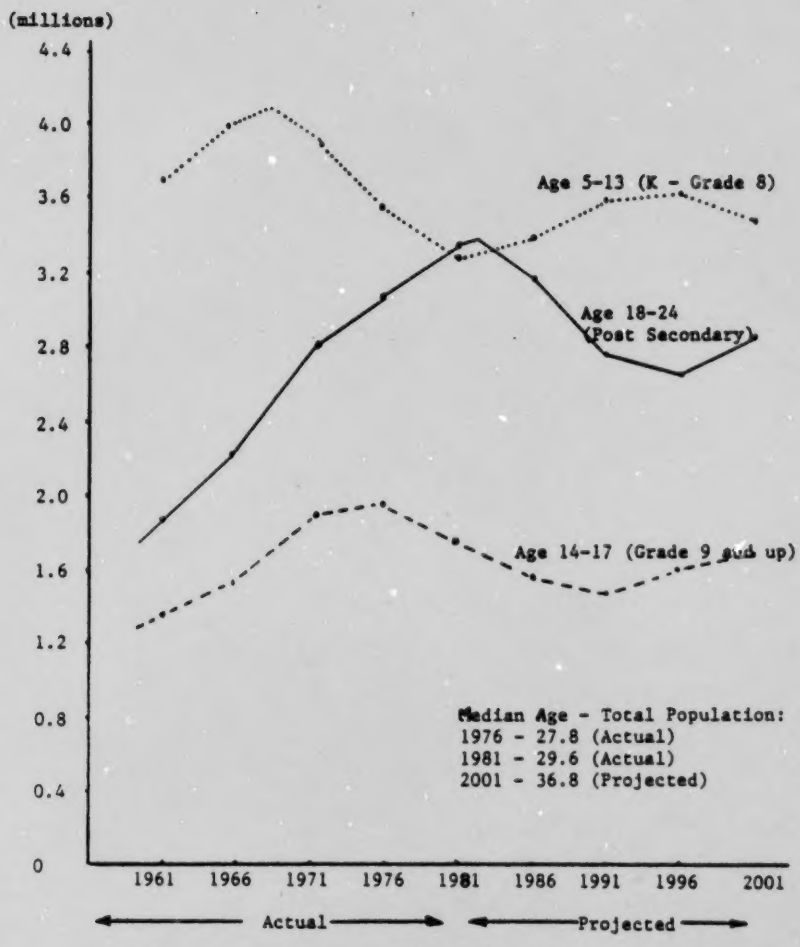
---

1 Statistics Canada, 1981 Census of Canada, Population - Age, Sex and Marital Status, Cat. No. 92-901.

2 Statistics Canada, Advance Statistics of Education, 1983-84, Cat. No. 81-220

CHART 1

SELECTED AGE GROUP POPULATION
CANADA
1961-2001



Sources: Clark, W., Devereaux, M.S., Zsigmond, Z, The Class of 2001, Statiscics Canada, February 1979.

Statistics Canada, Trends in Canadian Education, 1961 - 1984, September, 1982

An upward trend in births began in 1980. This will raise pre-elementary enrolment by 3.6% between 1983 and 1985. In 1983-84, the school age population continues to diminish, but at a slower pace than before. Accordingly, enrolment at the elementary - secondary level decreased by 0.9% between 1981 and 1982, and by 0.7% between 1982 and 1983. Between 1983 and 1984 a 0.3% decrease in these enrolments is projected, followed by a slight increase (+.05%) by 1985.

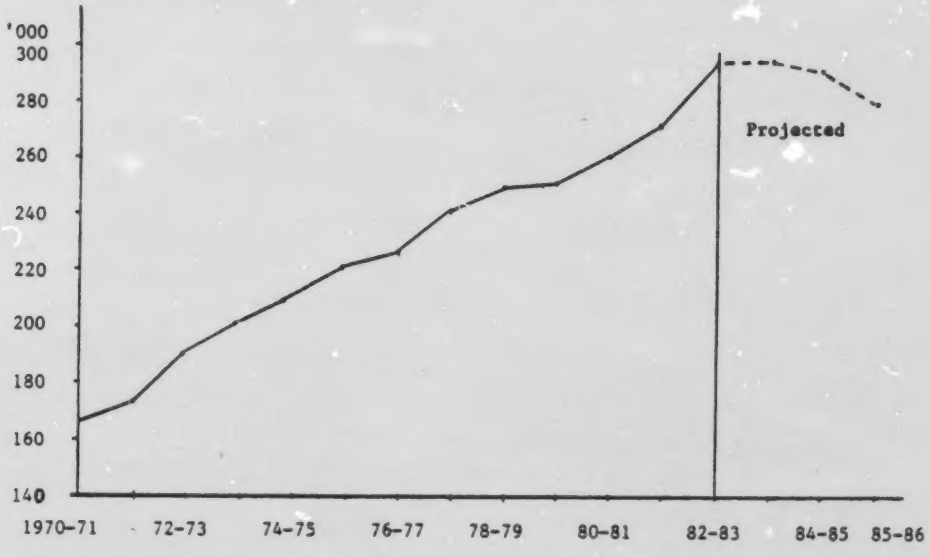
The post-secondary source population (age 18 - 24) is projected to grow by only 0.3% in both 1983 and 1984. By 1985 a 3% drop in this population will occur, marking the beginning of a ten year negative growth trend. Nevertheless, full-time enrolment in post-secondary institutions is expected to increase by almost 2% in 1983-84 and remain relatively unchanged (+0.4%) in 1984 - 1985. The rising participation rate can be, at least partially, attributed to high unemployment particularly for young people. Even the 3% source population drop in 1985 will only reduce total post-secondary enrolments by 1.6%.

Full-time enrolment in colleges (Chart 2) should peak in 1983-84, but is projected to decline in the next two years (-1.3% and -4% respectively). Full-time university enrolment (Chart 3) is projected to increase by 1.5% in 1984, while a 0.5% drop is projected for 1985. Though increasing participation will help offset the severity of the impact of a declining source population, enrolment declines can be expected to continue into the 1990's.

Female participation in post-secondary education has been progressively increasing (Chart 4). In 1971 women comprised 40% of full-time post-secondary enrolment while in 1983 this is estimated to rise to 50%. On the average, females comprise a slight majority (51%) of the full-time college population, while males are dominant (54%) in the universities. Nevertheless, more than half of the bachelor and first professional degrees awarded in 1983 were earned by women.

CHART 2

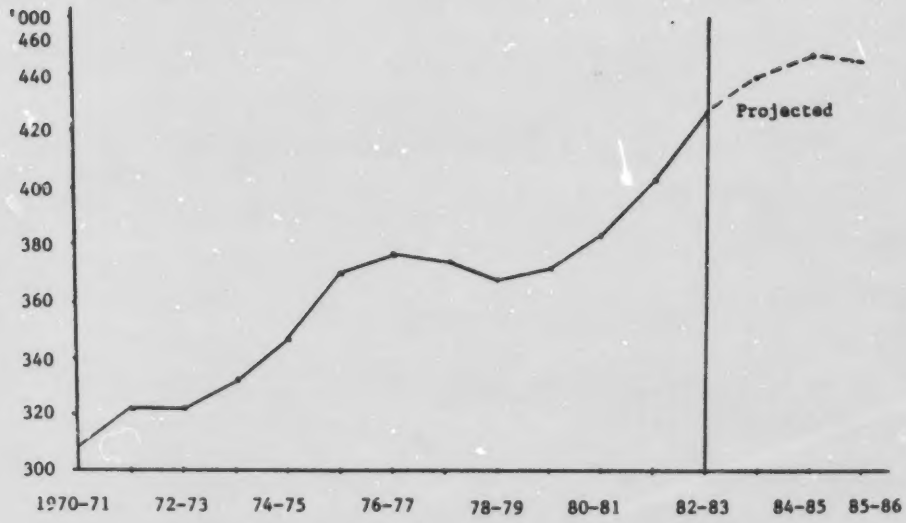
FULL-TIME COMMUNITY COLLEGE ENROLMENT
CANADA
1970-71 to 1985-86



Source: Statistics Canada, Advanced Statistics of Education, 1983-84, Cat. No. 81-220.

CHART 3

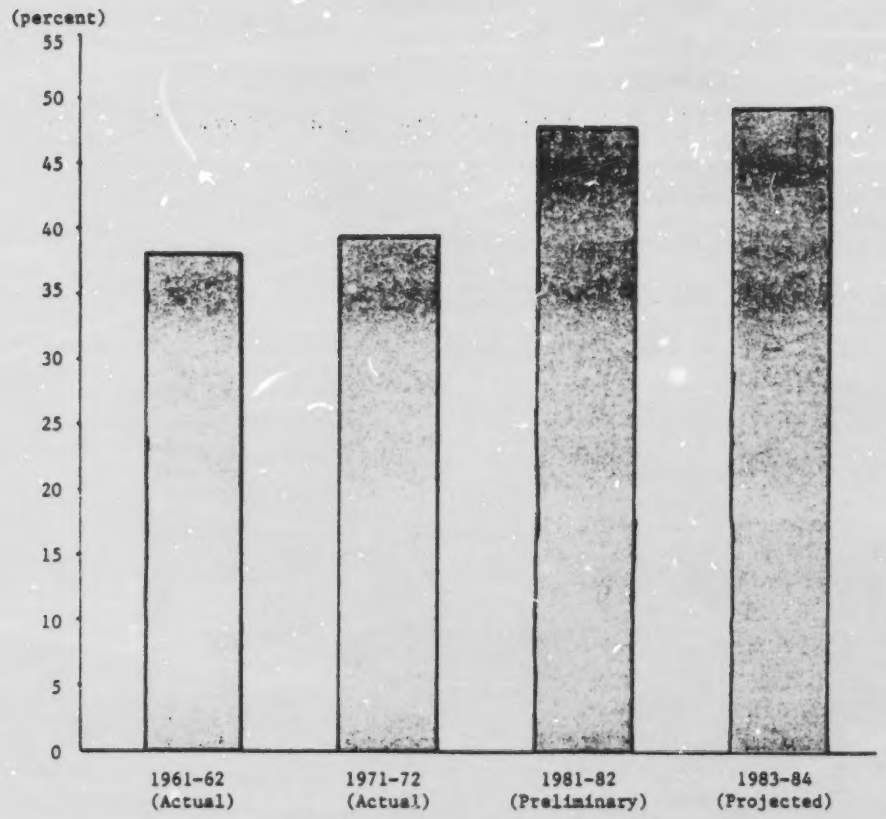
TOTAL FULL-TIME UNIVERSITY ENROLMENT
CANADA
1970-71-1985-86



Source: Statistics Canada, Advanced Statistics of Education 1983-84, Cat. No. 81-220.

CHART 4

FEMALES AS A PERCENT OF FULL-TIME POST-SECONDARY ENROLMENT
CANADA
1961-1984



Source: Statistics Canada, Trends in Canadian Education
1961-62 to 1983-84, September 1982

II. PROVINCIAL TRENDS

A. General[3]

British Columbia's mid-1983 population was estimated to have reached 2.8 million, for a 1.2% growth over 1982. Historically, this is one of the lowest annual growth rates ever experienced in B.C. Typically, B.C.'s growth rate has been double that of the nation, averaging 2.64% per annum. Unlike the nation, this slowdown is not primarily due to a decline in births, but rather, it is attributable to a 45% decline in net migration between 1982 and 1983. Historically, this decline is exceeded only by the 67% decrease in net migration experienced between 1975 and 1976 (Chart 5). This would appear to indicate that an integral relationship exists between periods of negative economic performance and low migration rates. This is particularly true of interprovincial migration, where, in 1975/76, more people moved out of B.C. to another province than moved in from another province. Net interprovincial migration is projected to rise steadily over the next five years, then stabilize. Net international migration is expected to remain near current levels over the medium term.

Meanwhile, natural increase has risen slightly, but consistently, since 1974. In 1982, the number of births in B.C. reached a record level and is being called the "echo baby boom".[4] This increase in birth rates is projected to continue in the short term and peak between 1987 and 1990. For the education system, this means that within 6 years, there will be more entry-level elementary students than at any time in provincial history. The cumulative effect of the increase in births could result in an all-time high for enrolment in British Columbia's elementary and secondary schools by the mid-1990's. On this basis, it can be assumed that by the year 2000 the post-secondary source population should also increase significantly.

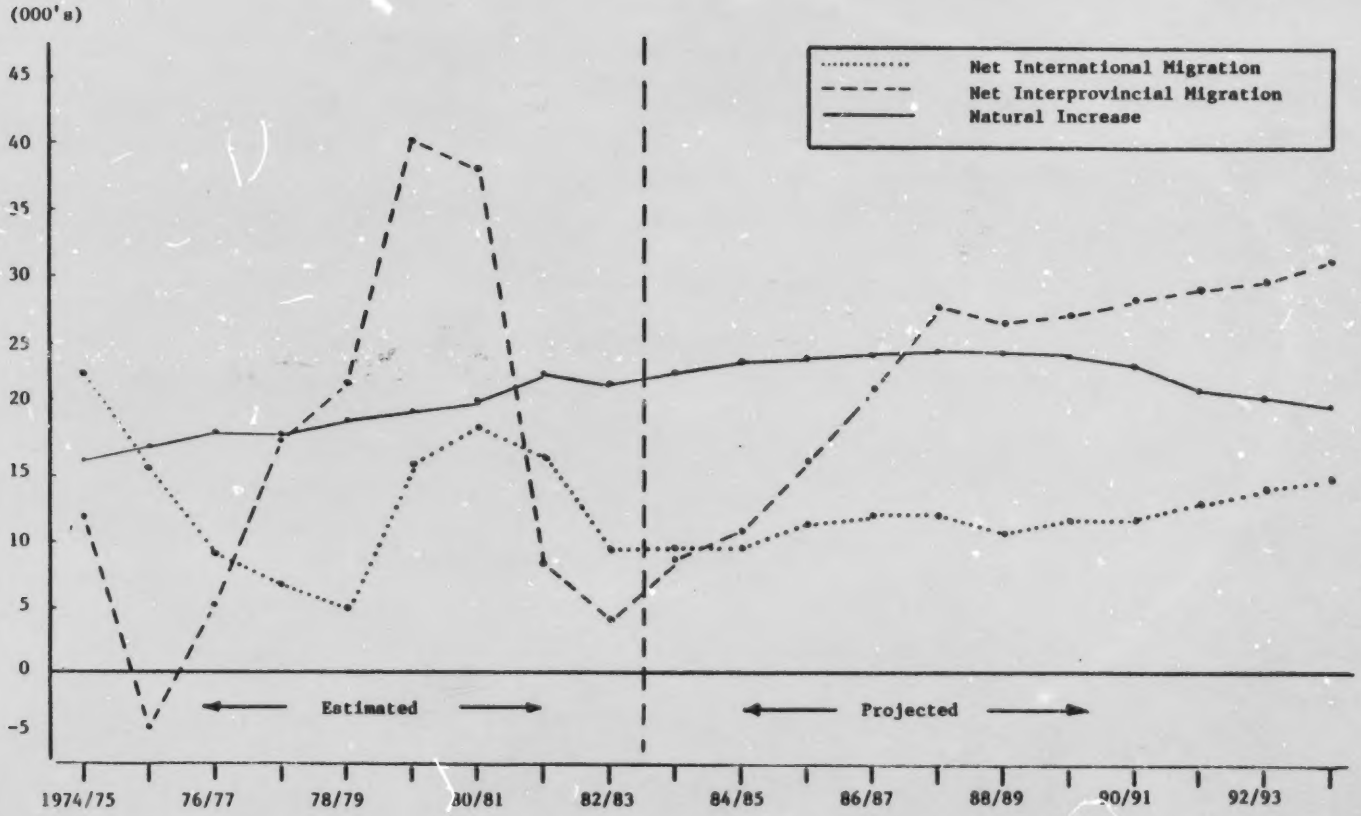
---

3 Central Statistics Bureau, B.C. Population Projection 9/83, 1983-2000, Ministry of Industry and Small Business Development, Government of B.C.

4 B.C. Central Credit Union, Economic Analysis of British Columbia, Vol. 3, No. 1, April 8, 1983.

CHART 5

B.C. POPULATION
COMPONENTS OF CHANGE
1974-1994



Source: Central Statistics Bureau, Projection 9/83, Government of British Columbia
Note: All figures are from June 1 to May 31.

Between 1982 and 1991, British Columbia's population is projected to increase by 17% (Table 1) for an annual average growth rate of 1.7%. In comparison, the province experienced 3.0% average annual growth between 1961 and 1971 and 2.3% between 1971 and 1981. In the long term, the growth trend is anticipated to be relatively stable, increasing at a steady rate of 1.9% per year. Between 1982 and 1986, natural increase will account for 54% of population growth, while net migration will account for 61% of growth between 1986 and 1991.

During the same period (1982-91), the population of the Lower Mainland is projected to increase by 15.4%, from 1.45 million in 1982 to 1.68 million in 1991 (Table 2)[5]. An average annual growth rate of 1.6% is projected. The Lower Mainland population, as defined herein, currently accounts for approximately 52% of the provincial population and is projected to continue to account for the majority of the population. Historically, migration has contributed over 50% of the population growth in the Lower Mainland. But, as occurred throughout the province, there has been a net outflow recorded since 1982. This outflow is projected to continue until 1986-87. Between 1987 and 1991, inward migration is projected to increase slowly, but only reach approximately 50% of historical levels. Accordingly, natural increase is projected to account for 100% of population growth between 1982 and 1986, decreasing to 80% by 1991. The number of births are expected to increase steadily through 1988 and then begin a downward trend.

The female population in the province has a slight majority (50.4%) and is expected to maintain this minimal dominance. The same is true for the Lower Mainland, where females comprise approximately 51.5% of the population.

---

[5] B.C.F.C., Sub-Provincial Population Projections, 1983.

TABLE 1

Population and Age Distribution

British Columbia[a]

1982 - 1991

(Thousands)

	TOTAL	18-21	22-24	25-29	30-34	35-39	40+
1981	2790	193	155	254	242	203	1012
1983	2824	199	150	257	244	214	1038
1984	2864	193	155	260	249	223	1064
1985	2907	185	154	263	253	234	1090
1986	2957	176	153	266	258	244	1119
1987	3014	173	151	270	264	246	1156
1988	3077	175	146	276	269	250	1193
1989	3137	179	140	281	274	256	1229
1990	3199	181	135	283	280	261	1265
1991	3261	179	137	281	285	267	1301

Population and Age Distribution

Lower Mainland[b]

	TOTAL	18-21	22-24	25-29	30-34	35-39	40+
1982	1452	105	85	134	127	108	549
1983	1475	101	86	137	129	115	562
1984	1492	96	84	140	131	119	575
1985	1512	91	82	143	133	125	588
1986	1535	86	79	145	136	130	602
1987	1561	84	76	146	140	131	622
1988	1591	85	73	146	144	133	641
1989	1619	87	70	144	148	135	659
1990	1648	87	68	140	152	138	678
1991	1676	85	69	136	155	141	697

Sources: [a] Central Statistics Bureau, Projection 9/83, Ministry of Industry and Small Business Development, Government of B.C.

[b] B.C.F.C., Sub-Provincial Population Projections, 1983.

Note: Lower Mainland consists of the following college regions: Vancouver, Douglas, Kwantlen, Capilano and Fraser Valley.

British Columbia's population continues to age, with a median age of about 32 years in 1983. By 1995, this is projected to increase to around 34 years. Despite an increase in births, the proportion of young in the population will continue to steadily decline. Whereas those under 20 years of age accounted for 37% of the population in 1971, in 1981 they only accounted for 30% and are expected to account for not more than 27% of the population by 1991. Meanwhile, the proportion of elderly (60+) has been increasing, from 13% in 1971, to 15% in 1981, and projected to be 17% by 1991.

While previous declines in birth rates (1960's and 1970's) have contributed significantly to the aging of the provincial population, the inward migration of retirees has also been occurring [6]. Old age pension transfer data indicate a 100% increase in net inflow for 1983 over 1982, while family allowance transfers show a net outflow. Geographic and climatic factors have been cited as contributing to the influx of senior citizens, while higher unemployment rates have negatively affected interprovincial migration by families to this province in the past year.

The Lower Mainland is projected to exhibit the same aging trend as that of the province. When the distribution of the age groups within the population are examined, comparable trends are evident (Charts 6 and 7). Of interest is the more rapid negative growth rate for the 18 - 21 age group in the Lower Mainland than in the province as a whole. Between 1982 and 1987, the average annual growth rate for the 18 - 21 age group in B.C. is expected to be -2.2% compared with -4.4% in the Lower Mainland. The median age in the Lower Mainland was 34 in 1982 and is projected to increase steadily, reaching 37 years by 1991.

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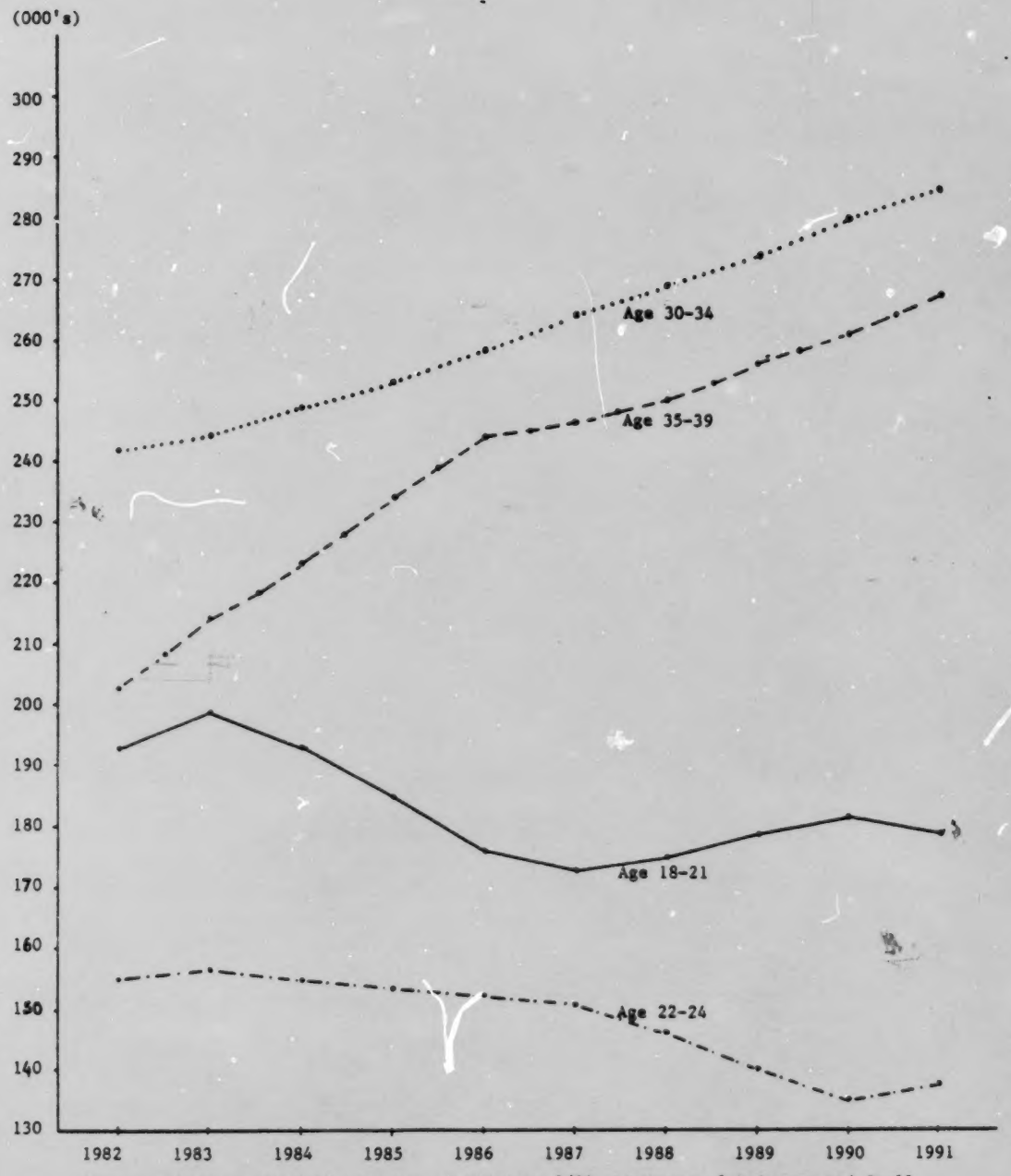
6 B.C. Central Credit Union, Economic Analysis of British Columbia, Vol. 3, No. 5, September 1983.

It should be noted that there are inherent difficulties in producing accurate population projections. All projections are based on the known values of past trends to which varying assumptions of change are applied. Depending upon which specific assumptions are applied, and to what degree, forecasts from different sources can vary significantly despite having a common known base. Chart 8 illustrates this situation, comparing age group projections of B.C. Research to those of the B.C. government's Central Statistics Bureau. In this instance, though both begin with the 1981 actual census base, future projections differ by between 5,000 to in excess of 30,000 people. Though the basic direction of the trends are similar for each age group, the growth rates deviate substantially,both within and between the two age groups. Beyond differences in methods between sources, there exists the difficulty of anticipating future developments, particularly in the socio-political arena. Unanticipated changes in legislation, for example, can have measurable effects on the future growth rate of a population. Therefore, though projections are useful indicators upon which to plan, they cannot be considered factual predictions of the future. They are, instead, logical and sequential extensions of historical patterns.

CHART 6

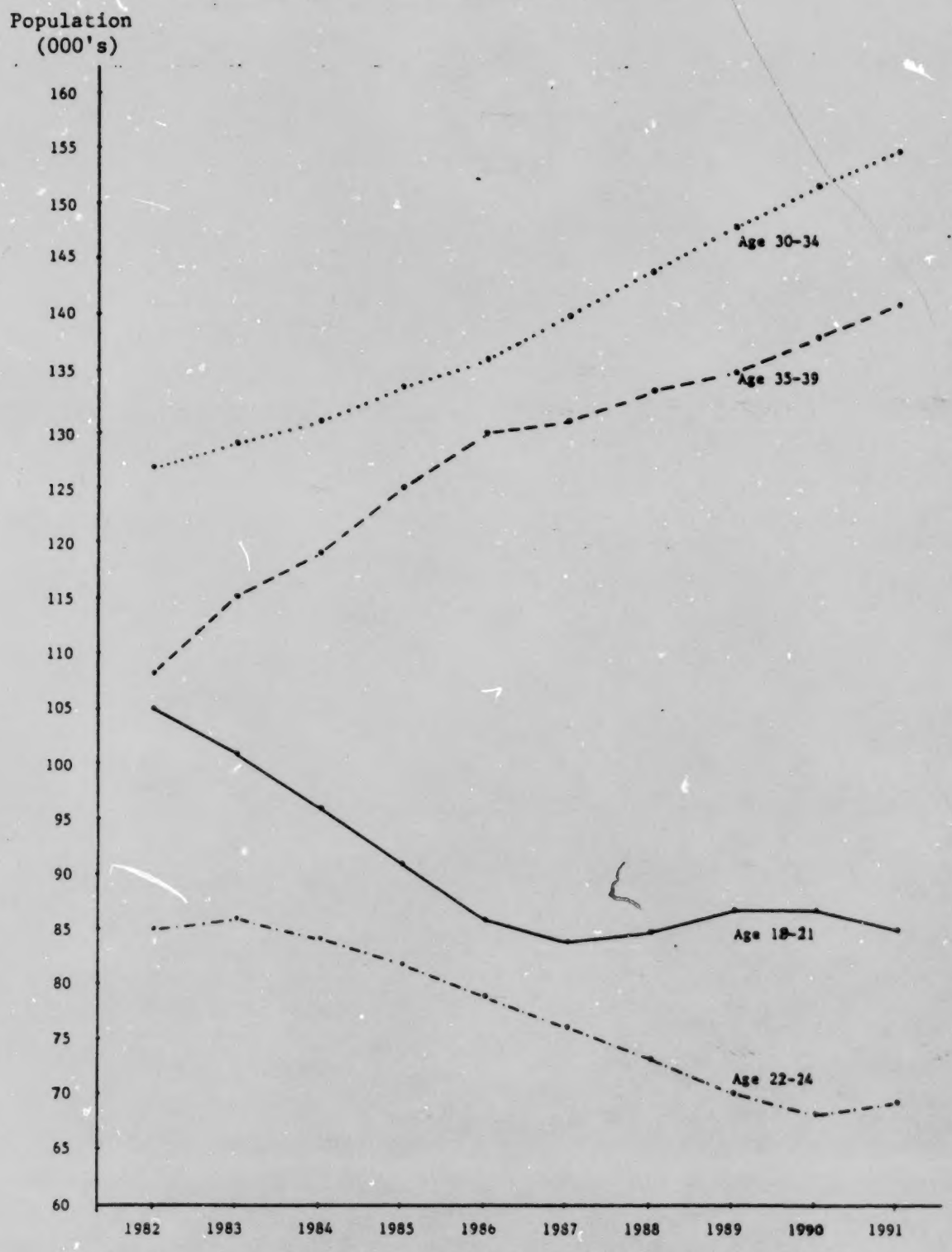
SELECTED AGE GROUP POPULATION
BRITISH COLUMBIA
1982-1991



Source: Central Statistics Bureau, Projection 9/83, Ministry of Industry and Small Business Development, Government of British Columbia

CHART 7

SELECTED AGE GROUP POPULATION
LOWER MAINLAND
1982-1991



Source: B.C.F.C., Sub-Provincial Population Projections, 1983.

B. Trends in Education

Provincial enrolment in Grade XII has been fluctuating between 36,000 and 37,000 for the past six years (Table 2)[7]. In 1983, enrolment is estimated to drop by 6.6%, and continue a downward trend for the next two years. In 1986, a 4% gain should be realized, marking the beginning of a slow upward trend. Nevertheless, attainment of past enrolment levels is not expected over the medium term. A comparable trend is projected for Grade XII enrolment in the Lower Mainland (Chart 9). By 1987, it is projected that provincial Grade XII enrolment will be 5.4% lower than it was in 1977, while in the Lower Mainland it will be 12% lower than in 1977. This is consistent with the population trends which project a more rapid decrease in the younger population in the Lower Mainland than in the province as a whole. In essence, the post-secondary source population in the Lower Mainland is decreasing at double the rate of the province. In fact, even the proportion of those enrolled in Grade XII in the Lower Mainland is decreasing. In 1977 the Lower Mainland accounted for over 52% of Grade XII students. By 1987 this is expected to drop to 48.5%. Vancouver Island is projected to maintain its relative share, while the remainder of B.C. should realize proportionate gains.

Full-time college enrolment (excluding vocational) has been rising steadily since 1972, although the rate of increase slowed substantially after 1975 (Chart 10)[8]. Growth in 1981 was relatively low, at 3.3%, but rebounded in 1982 with a 12.3% increase enrolment. This was the greatest rate of increase since 1974. Full-time enrolment in 1983 is expected to grow, but at a lower rate of approximately 4% while 1984 enrolments are projected to decline by up to 1%. This is consistent with the national pattern of enrolment trends, as well as provincial projections for the post-secondary source population.

7 B.C.F.C., Historical Enrollment Trends for B.C. Universities 1967-1982, Working Paper #8, September 1983.

8 B.C.F.C., Trend Analysis of Enrollments & Participation Rates in B.C. Post Secondary Education 1967 - 1981, Report #44, June 1983.

TABLE 2

September Grade XII Enrolment

By B.C. Region

1977 - 1987

YEAR	LOWER MAINLAND #	LOWER MAINLAND %	VANCOUVER ISLAND #	VANCOUVER ISLAND %	TOTAL PROVINCE (100%)
1977	19267	52.1	7011	19.0	36954
1978	18955	51.8	6821	18.6	36618
1979	18744	50.9	7112	19.3	36792
1980	18811	51.2	6792	18.5	36705
1981	17998	49.7	6868	19.0	36189
1982	17987	49.4	7015	19.3	36387
---------- P R O J E C T E D ----------					
1983	16819	44.5	6530	19.2	33985
1984	16316	49.4	6160	18.7	33016
1985	16094	48.9	6240	18.9	32918
1986	16605	48.5	6511	19.0	34235
1987	16940	48.5	6765	19.3	34960

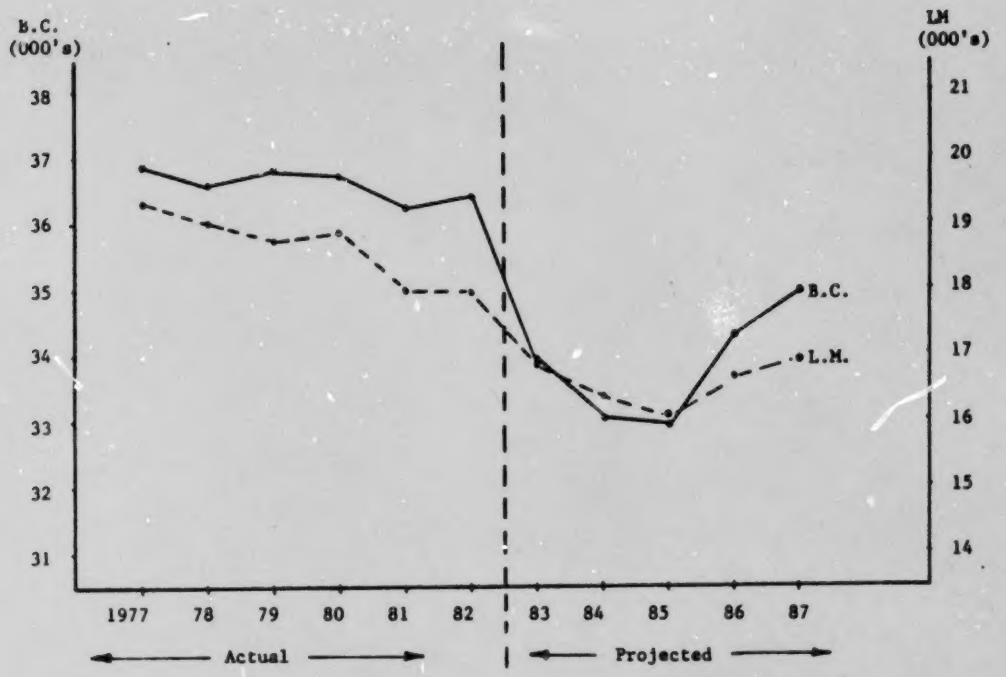
Source: Weldon, M. Jill, Historical Enrollment Trends for British Columbia Universities 1967 - 1982, The British Columbia Post-Secondary Education Enrollment Forecasting Committee, Working Paper #8, September, 1983.

Note: Lower Mainland includes the following college regions: Vancouver, Douglas, Kwantlen, Capilano and Fraser Valley.

Vancouver Island includes: Camosun, Malaspina and North Island college regions.

CHART 9

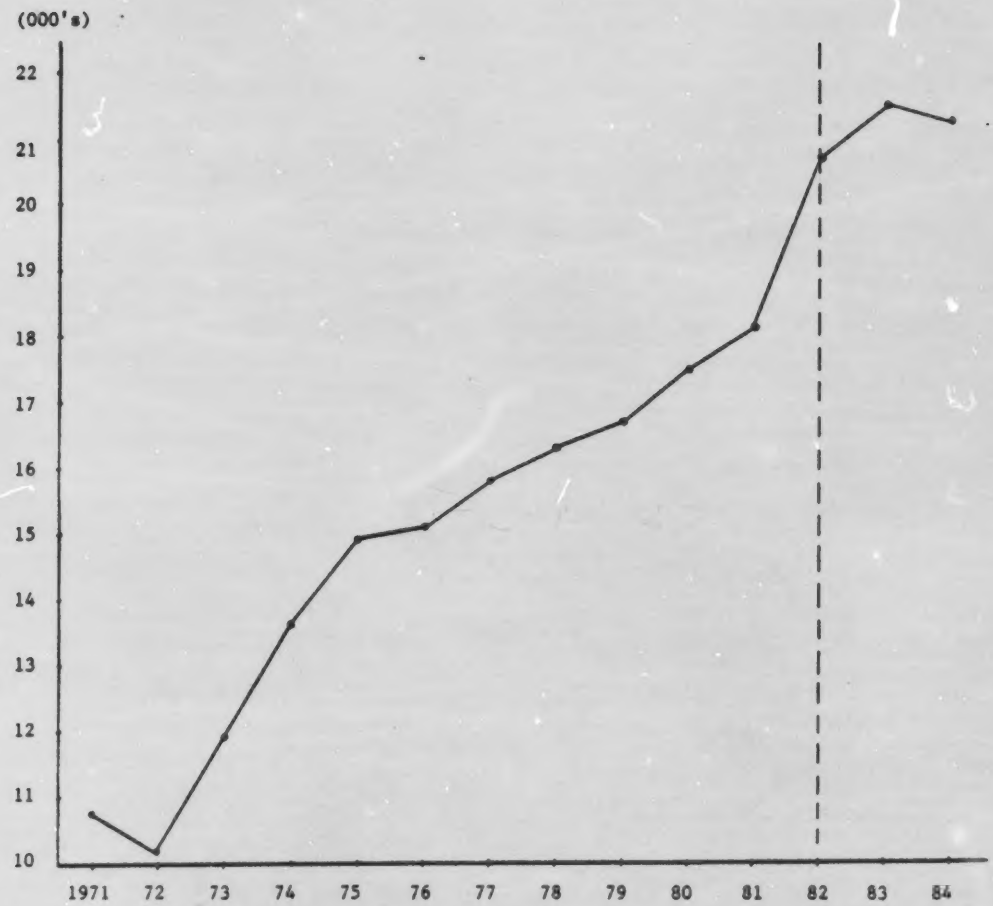
TOTAL SEPTEMBER GRADE XII ENROLMENT
BRITISH COLUMBIA AND LOWER MAINLAND
1977-1987



Source: See Table 2, BCFC Working Paper #8

CHART 10

FULL-TIME COLLEGE AND INSTITUTE ENROLMENT
1971-1984



Sources: For 1971-1981: BCFC, Trend Analysis of Enrolments and Participation Rates in B.C. Post-Secondary Education 1967-1981, Report #44, June 1983

For 1982-1984: Statistics Canada, Advance Statistics of Education 1983-1984, Catalogue 81-220 Annual, August 1983

Full-time university enrolment in B.C. has been steadily increasing since 1978 (Chart 11). The growth rate in 1981 was nearly the same as that in the colleges (3.1%), but the 1982 rate of increase of 5% was substantially below that of the colleges. Estimates of enrolment for 1983 reflect a 3% increase, declining to a less than 1% increase in 1984. Accordingly, full-time university enrolment levels are not expected, in the short term, to be as negatively affected as college levels, though decreases could be realized by 1985.

Part-time post-secondary enrolment dropped in 1981 for the first time on record. This decline in the overall system is a reflection of the 3.8% drop in part-time college enrolments (Chart 12). In 1982, a further decrease of 2.6% was recorded by the colleges. Meanwhile, part-time enrolment in the university sector has grown steadily, albeit at a recently declining rate (7.9% in 1981 and 5.3% in 1982). Part-time enrolment has historically grown at a faster rate than full-time. Decreases in part-time college enrolments have been attributed to financial constraints and policies which give preference to full-time students over part-time students[9]. Nonetheless, twice as many part-time students are enrolled in colleges as are in universities. Since the part-time source population (aged 25 and over) is projected to steadily increase, even if participation rates remain constant, part-time enrolment should increase as a proportion of total post-secondary enrolment by nature of the changing age structure alone.

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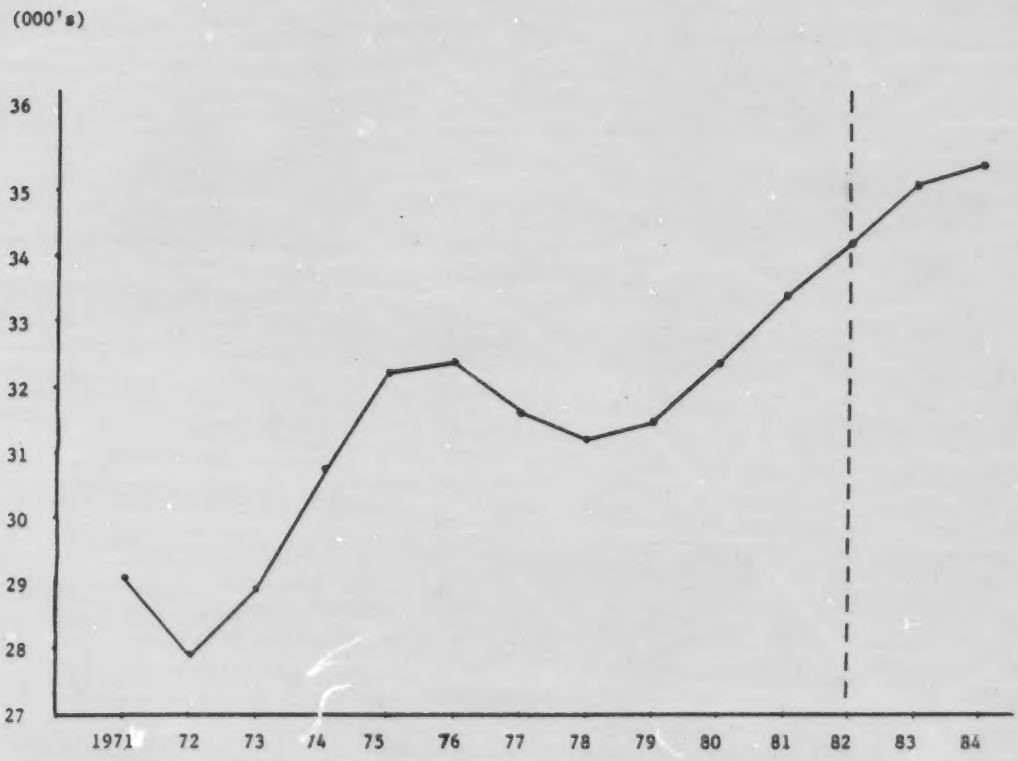
9 B.C.F.C., Trend Analysis of Enrollments and Participation Rates in British Columbia Post-Secondary Education 1967 - 1981, Report #44, June 1983.

CHART 11

FULL-TIME UNIVERSITY ENROLMENT
BRITISH COLUMBIA
1971-1984

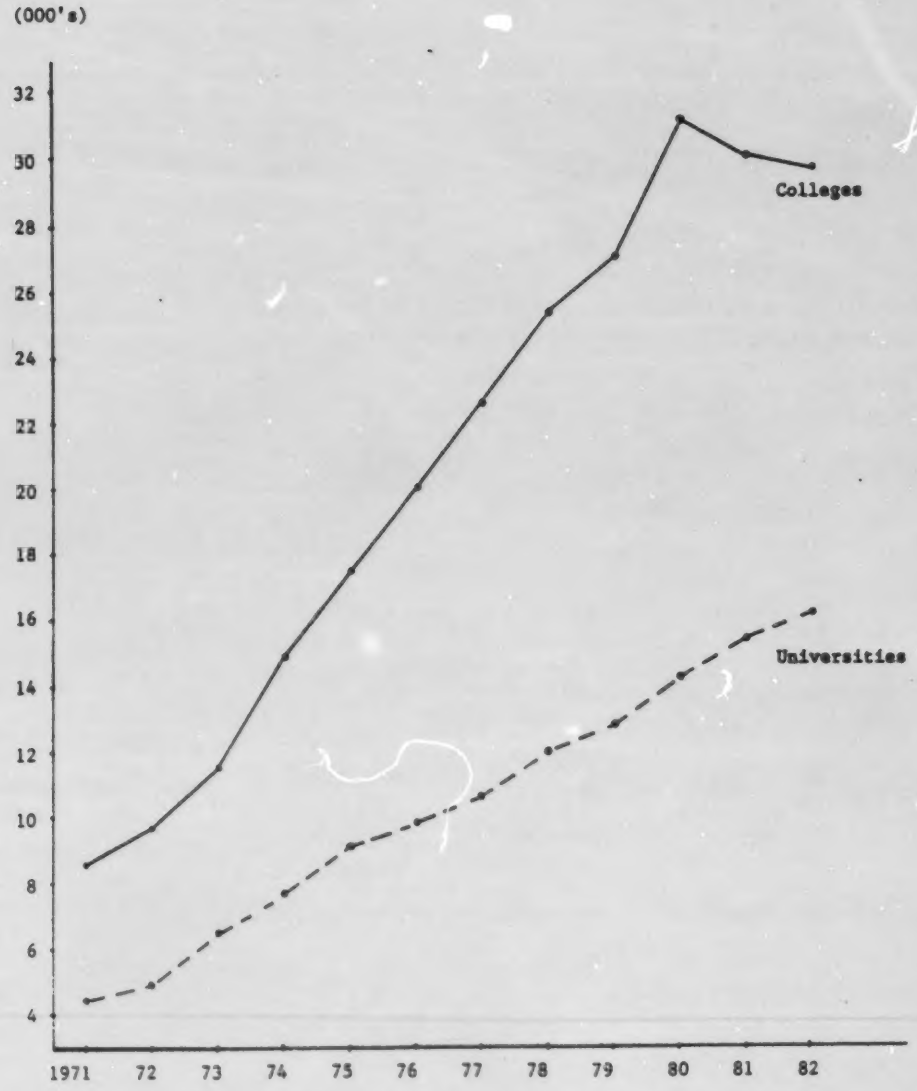


Sources: For 1971-1981: BCFC, Trend Analysis of Enrolments and Participation Rates in B.C. Post-Secondary Education 1967-1981, Report #44, June 1983

For 1982-1984: Statistics Canada, Advance Statistics of Education 1983-1984, Catalogue 81-220 Annual, August 1983

CHART 12

PART-TIME POST-SECONDARY ENROLMENT
BRITISH COLUMBIA
1971-1982



Source: BCFC, Historical Enrolment Trends for B.C. Universities 1967-1982, Working Paper #8, September 1983

III. BCIT STUDENT PROFILE

A. Full-time Enrolment

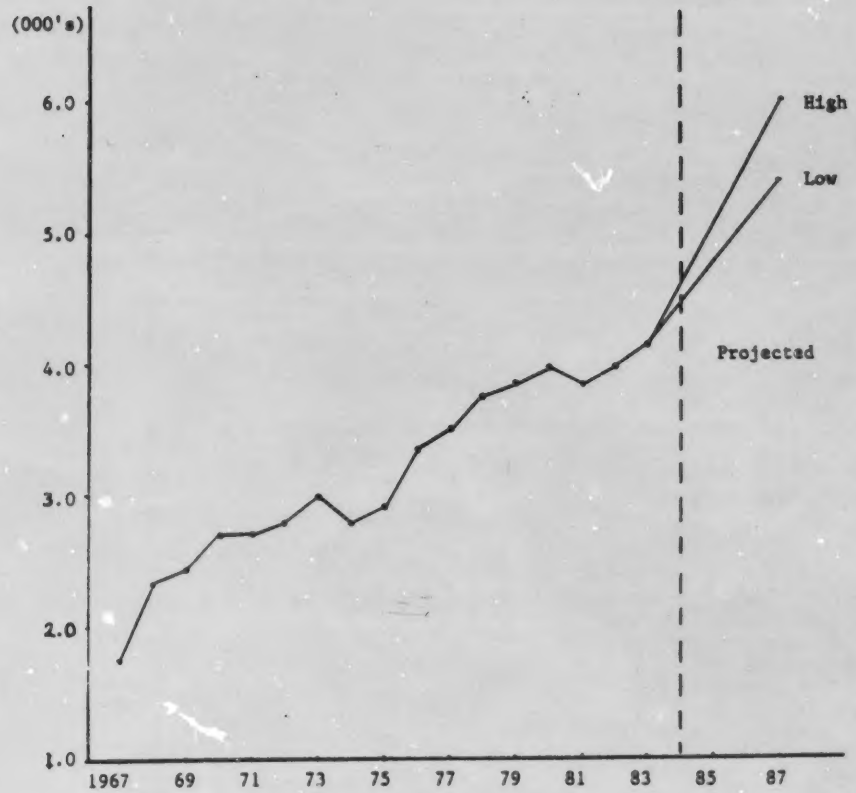
Full-time diploma student enrolment in 1983 increased by 6% from 1982. The highest rate of increase was again in the Engineering Division, with enrolments up 8%. The Business and Health Divisions also recorded increases of 4% and 5% respectively. BCIT's full-time enrolment has risen slowly but steadily since 1967, with the exception of declines in 1974 and 1981 (Chart 13). For the past five years (1977-82) the average annual growth rate in enrolments was +2.4%. Alternate enrolment projections for the next four years (1983-87) reflect anticipated average annual growth rates of between +6% and +9%. Since the conventional source population is expected to diminish at an annual rate of between -2% to -5% during the same time period, increased participation by all age groups will be required in order to attain projected enrolment levels.

Participation of females in full-time programs decreased in proportion to males by 1% from 1982 to 1983 (Table 3). For first year first-time students, females account for 37% of full-time enrolments, while in the second year, they account for 39%. Between 1982 and 1983, first year first time enrolments increased for males by 1.1% and for females by 3.3%. Second year enrolments increased for males by 15%, but decreased by 2.2% for females. Despite a continued reduction in the proportional representation of females, increases in first year enrolments indicate an upward trend in female participation.

The average age of first year first time students continues to slowly increase (Table 4). The proportion of students aged 18 through 21 has been steadily declining since 1978 (Chart 14). Simultaneously, increases in enrolments in older age groups have been occurring. In keeping with the changing age structure of the province, the aging of BCIT's student population is projected to continue in the medium term.

CHART 13

FULL-TIME BCIT ENROLMENT
1967-1987

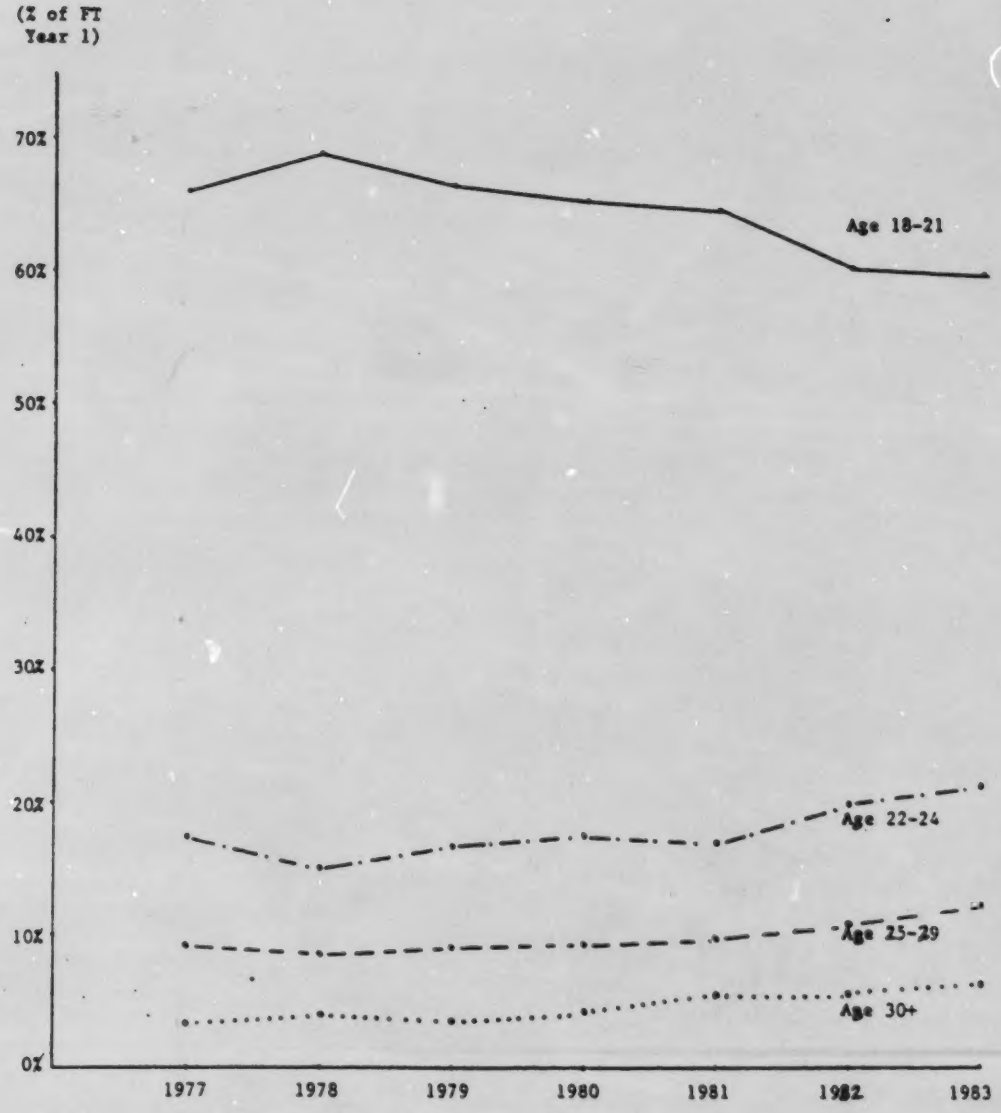


Source: Weldon, M. Jill, Historical Enrolment Trends for B.C. Colleges 1967-1982, BCFC, Working Paper #7, August 1983

BCIT Internal Enrolment Projections - 1983 Actual; 1984-1987 High and Low Alternative Projections.

CHART 14

BCIT FIRST TIME FULL-TIME YEAR 1 ENROLMENT
DISTRIBUTION OF SELECTED AGE GROUPS
1977-1981



Sources: Weldon, M. Jill, Age Distribution Tables 1972-1981, March 1983.
1983 Halloween Report

TABLE 3

B.C.I.T. FULL-TIME ENROLMENT BY SEX

1975-76 to 1982-84

(Percentage)

YEAR	MALE	FEMALE
1975-76	66.5	33.5
1976-77	65.5	34.5
1977-78	65.9	34.1
1978-79	66.0	34.1
1979-80	64.0	36.0
1980-81	60.0	40.0
1981-82	58.2	41.7
1982-83	61.0	39.0
1983-84	62.0	38.0

Sources: BCIT Fact Book, 1981, (1975-76 to 1980-81 statistics)

BCIT Enrolment by Age and Sex Report (1981-82 to 1983-84 statistics)
1981:10:31 and 1982:09:27 and 1983:10:31

TABLE 4

AVERAGE AGE OF FIRST TIME, FULL-TIME B.C.I.T. STUDENTS

YEAR	AVERAGE AGE
1971	20.6
1972	20.7
1973	20.9
1974	20.7
1975	21.1
1976	20.8
1977	20.9
1978	20.9
1979	21.0
1980	21.1
1981	21.4
1982	21.6

Source: Weldon, M. Jill, Historical Trends for B.C. Colleges 1967-82, B.C.F.C. Working Paper #7, August 1983.

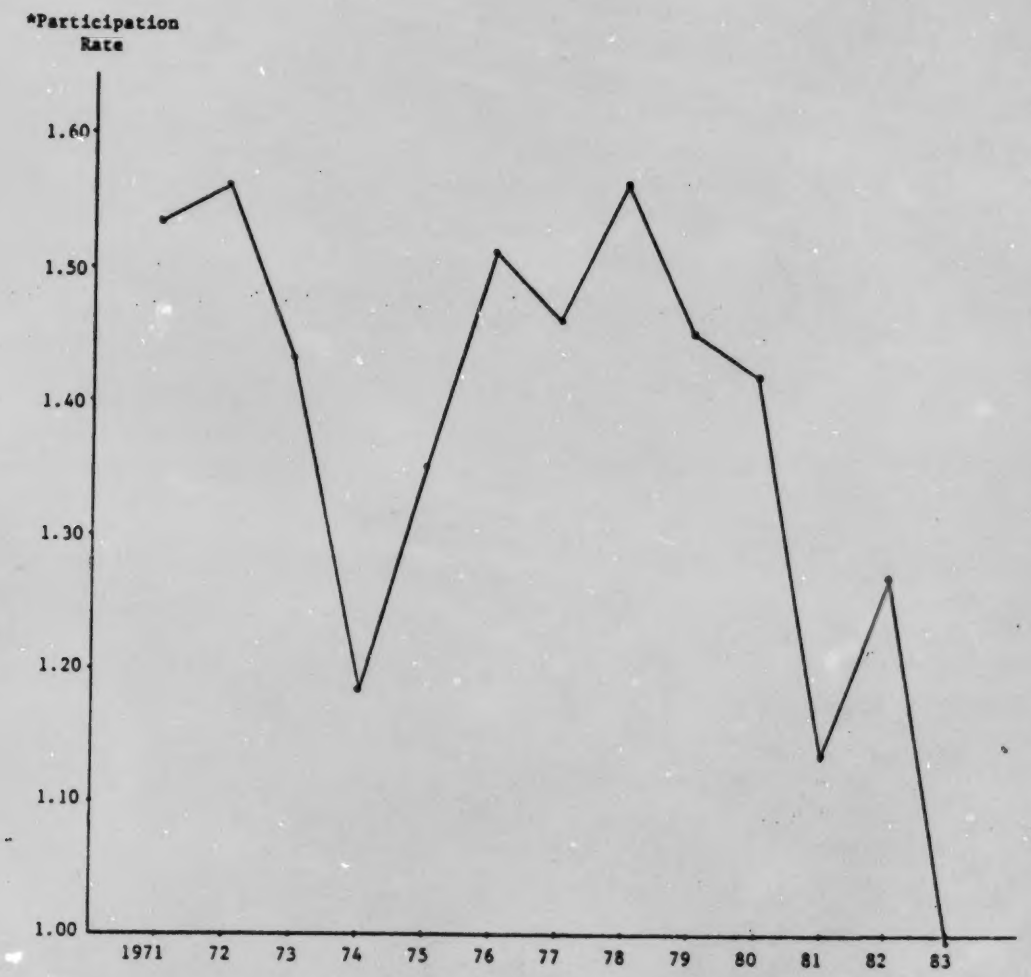
With a declining younger population, the relative importance of secondary schools, in terms of post-secondary source population, continues to diminish. The Grade XII participation rate for BCIT students has fallen to an all-time low (Chart 15). The number of first time full-time students coming to BCIT directly from attending secondary school fell by 22% from 1982 to 1983, whereas the number reportedly having been in the labour force (employed or unemployed) rose by 23.5% in absolute terms. The distribution of first-time students by main activity during the previous year reflects this shift (Chart 16). Of those for whom a main activity is recorded (approximately 75% of total first time full-time enrolments), 27.5% had been attending secondary school in 1982 while 51% were in the labour force. In 1983, the proportion attending secondary school declined to 20% while labour force participation increased to 59%. A shift of this magnitude in just one year cannot be attributed solely to the changing age structure. The rising participation rate of the labour force population is more likely related to high unemployment.

Since residential data on BCIT's current student population is not available, the location of B.C. secondary schools attended (regardless of year) is utilized as an indicator of geographic source (Table 5).This has limitations in that it is assumed that change in residence will not occur following attendance in secondary school, regardless of time elapsed. The Lower Mainland continues as primary source though an increase in draw from the remainder of B.C. has occurred in the past year. Since the majority of first-time students were not attending secondary school, this increase could be as much a reflection of residential mobility as it is an indicator of provincial draw. Accurate analysis of geographic source cannot be performed without the compilation of home residence information. This information has been collected in the 1983 BCIT First Year Student Survey and will be presented in a forthcoming report.

N.B. Previously included in this section was a table presenting source of students as a percentage of the previous years Grade XII regional enrolment. Since this computation does not control for year of last attendance in secondary school, it assumes that first time BCIT students were primarily Grade XII students the previous year. It has been demonstrated that this is not the situation, therefore invalidating the purpose of the table.

CHART 15

GRADE XII PARTICIPATION RATE FOR
FIRST TIME FULL-TIME YEAR ONE BCIT STUDENTS

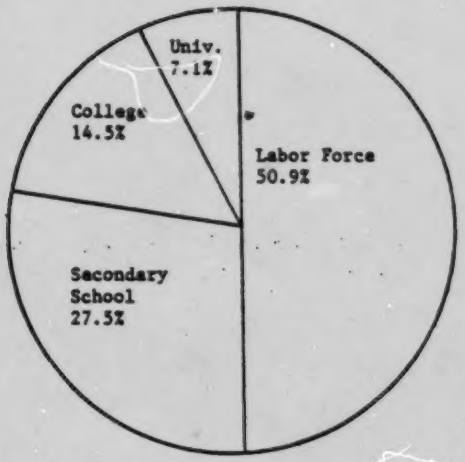


*Note: Participation Rate = First time 16-18 age group BCIT enrolment divided by B.C. September Grade XII enrolment.

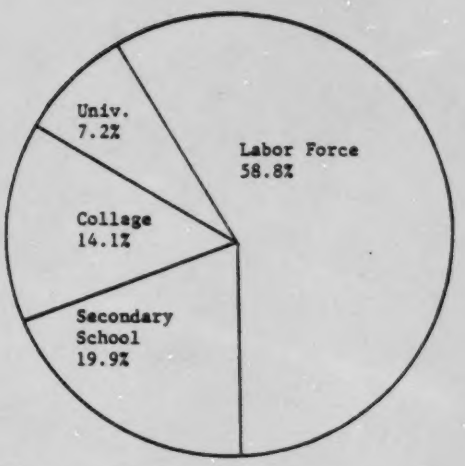
Source: Weldon, M. Jill, Historical Enrolment Trends for British Columbia Colleges 1967-1982, BCFC, Working Paper #7, August 1983.

CHART 16

BCIT FIRST TIME FULL-TIME ENROLMENT
BY MAIN ACTIVITY DURING PREVIOUS YEAR
1982 AND 1983



1982



1983

Note: Percentages are based on those reported, i.e. approximately 75% of total included, 25% not reported.

Labour Force includes employed and unemployed.

Source: BCIT College Statistical Report, Enrolment by Age, Sex and Enrolment Status (Halloween Report), 1983.

TABLE 5

SOURCE OF FIRST-TIME FULL-TIME B.C.I.T. STUDENTS

BY

LOCATION OF B.C. SECONDARY SCHOOL

1967 to 1983

(Percentage)

YEAR	LOWER MAINLAND	VANCOUVER ISLAND	OTHER B.C.
1967	62.6	17.6	19.8
1968	62.8	16.6	20.6
1969	64.2	13.6	22.2
1970	62.4	12.2	25.4
1971	69.7	10.2	20.1
1972	64.9	14.8	20.3
1973	68.7	12.9	18.4
1974	71.4	10.3	18.3
1975	70.8	11.8	17.4
1976	70.9	11.6	17.5
1977	73.1	11.1	15.8
1978	72.1	12.2	15.7
1979	71.6	11.6	16.8
1980	73.0	10.9	16.1
1981	73.1	9.3	17.6
1982	73.0	10.8	16.2
1983	71.7	10.2	18.1

Source: Weldon, M. Jill, Historical Enrollment Trends for B.C. Colleges, 1967-1982, B.C.F.C. Working Report #7, August 1973.

Lower Mainland includes the following college regions: Vancouver, Douglas, Capilano, Kwantlen and Fraser Valley.

B. Part-Time Enrolment *

From 1967 through 1980, part-time enrolment in career/technical programs grew dramatically (Chart 17). Between 1977 and 1980, the average annual growth rate in Fall enrolments was +22.4%, inclusive of a 40% increase in 1980 over 1979. The surge in enrolments in 1980 marked an all-time high. Subsequent declines in the past three years have resulted in a negative growth trend, exhibiting an average annual rate of -8.4%. When enrolment growth is averaged for 1977-83, the annual rate is +7%. This rate is three times that of full-time enrolments over the same period. Proportionately, part-time enrolments constitute over two-thirds of the total Institute headcount, while representing about 20% of total activity in terms of student contact hours.

The 1981 decline in part-time enrolment was common throughout the provincial college and institute system. As previously discussed, financial constraints and government policies have been cited as probable factors. Part-time enrolment projections based on population and participation indicate a return to the positive growth trend, unless budget constraints result in reductions in part-time programming.

Given the projected declines in the conventional full-time source population, the post-secondary system should maintain sufficient flexibility to respond to an increased demand for part-time studies through improved program availability and innovative delivery systems, particularly in credit courses.

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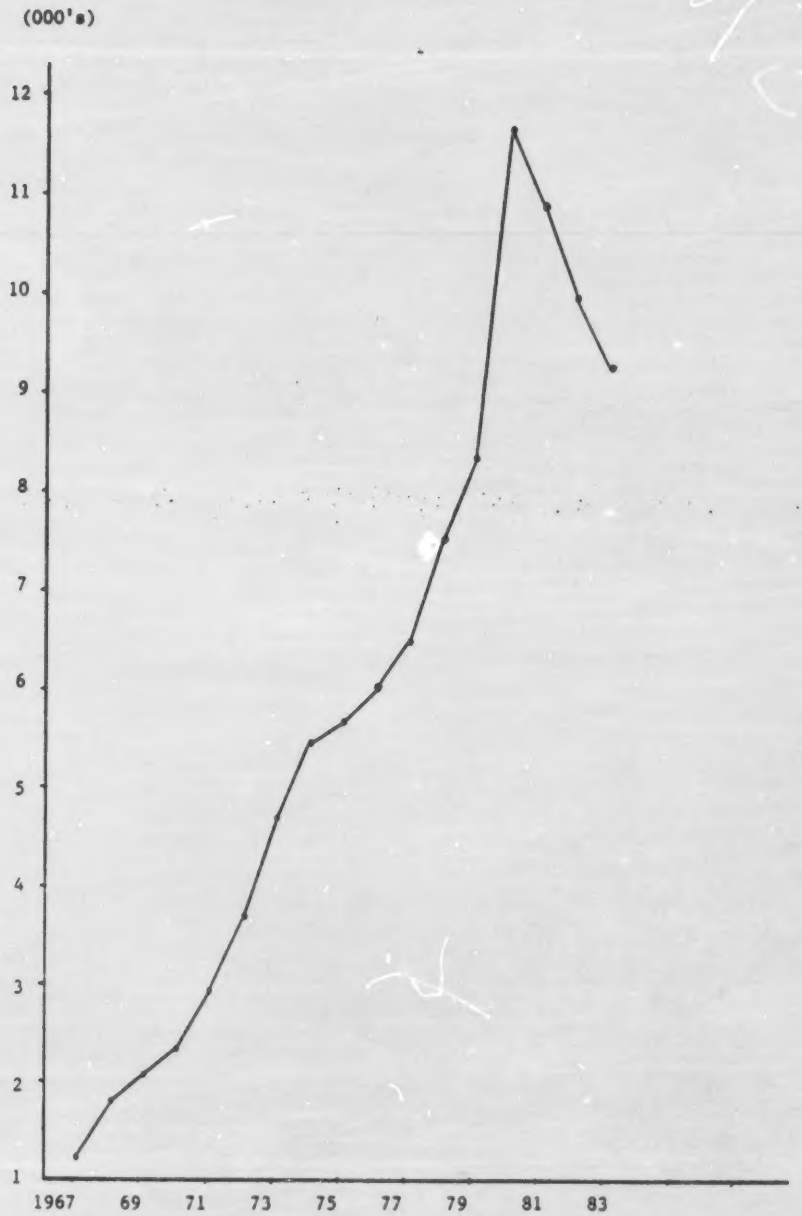
* N.B. For consistency, enrolment figures are based on October 31st headcount for career/technical programs only. Data are not inclusive of all C.E. & I.S. registrants, but are based on official figures as submitted to the M.O.E. in the annual Halloween Report.

CHART 17

PART-TIME BCIT FALL ENROLMENT
1967-1983



Source: Weldon, M. Jill, Historical Enrolment Trends for B.C. Colleges 1967-1982, BCFC, Working Paper #7, August, 1983

Note: Part-time enrolment figures are based on October 31 headcount.

The number of males enrolled in part-time programs decreased by 10% from 1982 to 1983, while the number of females decreased by 4%. This resulted in a slight increase in the proportion of females enrolled (Table 6)*. As more women enter the labour force, an increase in female participation should be realized.

The average age of part-time students increased minimally in 1982 (Table 7). Since the age group distribution in 1983 is comparable to that of 1982, little variation is anticipated (Chart 18). Past fluctuations (1978-81) in age composition appear to have stabilized with approximately 75% of part-time students aged 25 and over. Given that provincial population projections indicate growth in this primary part-time source population, increases in enrolment should be anticipated.

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* Note: 1982-83 percentages were based on preliminary data in the 1983 Outlook Report. Herein, these percentages have been adjusted according to official figures contained in the 1982-83 Halloween Report.

TABLE 6

B.C.I.T. PART-TIME ENROLMENT DISTRIBUTION BY SEX

1978-79 to 1983-84

(Percentage)

YEAR	MALE	FEMALE
1978-79	64.3	35.7
1979-80	61.2	38.8
1980-81	53.9	46.1
1981-82	55.5	44.5
1982-83	55.2	44.8
1983-84	53.6	46.4

Sources: BCIT Fact Book, 1981, (1978/79 to 1980/81 statistics)

BCIT College Statistical Report as at 1981:10:31 - "Enrolment by Age, Sex and Enrolment Status" (1981-82 Statistics).

Ibid: 1982:10:31 (1982-83 Statistics)
1983:10:31 (1983-84 Statistics)

TABLE 7

AVERAGE AGE OF PART-TIME B.C.I.T. STUDENTS

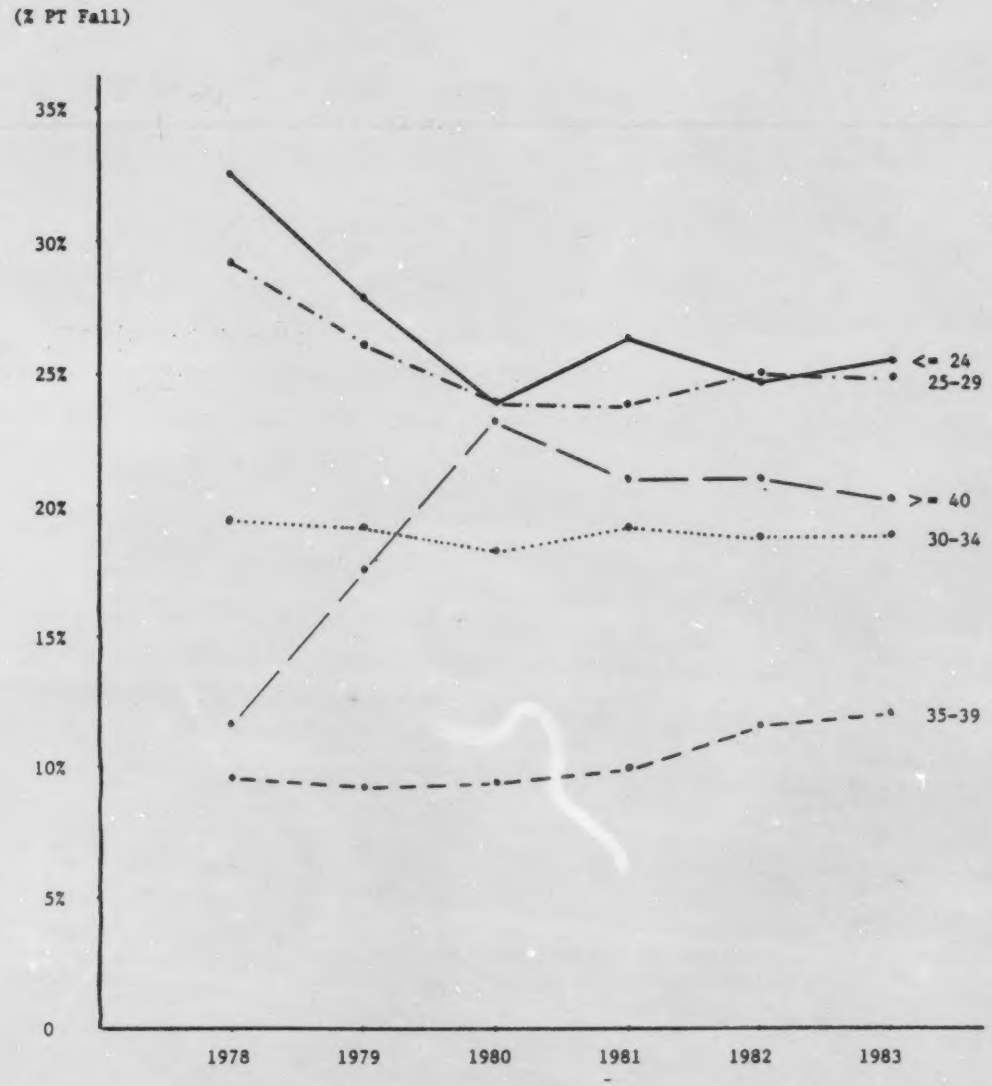
YEAR	AVERAGE AGE
1967	23.1
1968	21.4
1969	23.1
----	----
1978	29.4
1979	30.5
1980	31.8
1981	31.4
1982	31.6

Note: Data was not available for 1970-1977.

Source: B.C.F.C., Historical Enrollment Trends for B.C. Colleges 1967-83, Working Paper #7, August 1983.

CHART 18

PART-TIME BCIT FALL ENROLMENT
AGE GROUP DISTRIBUTION



Source: Weldon, M. Jill, Age Distribution Tables 1982-1981, BCFC, March 1983, 1983 - Halloween Report

C. Profile Studies

The 1983 Outlook Report summarized the relevant results of B.C. Research's Profile Study of Students Entering Career/Technical Programs in the British Columbia Colleges and Institutes. This study included a survey of the characteristics of the students who enrolled in a post-secondary institution for the first time in September 1981. For Institute purposes, an analysis of the responses of BCIT students only was provided.

As a continuation of the overall study of career/technical students in B.C., a follow-up survey of students 10 months after leaving their institution was conducted.[10] The target population consisted of students who had been enrolled as of September 1981 but who were no longer enrolled in September 1982. The purpose was to produce a longitudinal study of the same population, from initial entry to 10 months after leaving the post-secondary system. Once again analysis herein is restricted to BCIT student responses.

In April 1983 a follow-up questionnaire was mailed out to 3,451 BCIT students meeting the target population criteria. The responding sample consisted of 868 day students and 787 night students. Since 98% of the day sample had been full-time students while 87% of the night sample had been part-time students, results can be generalized according to full- or part-time status.

Summary of Results

1. Day Sample (Full-time)

   * 64% responding were male, with 75% aged 20-24.

   * Main objective for attending BCIT was to learn job skills (65%).

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10 Dennison, J., Jones, G., Forrester, G., B.C. Research, A Longitudinal Follow-up Survey of Students from Career/Technical Programs in British Columbia Community Colleges and Institutes, October, 1983.

* Educational goal was to complete a career/technical program on a full-time basis (94%).

* 63% met their goal, the highest rate of goal attainment within any institution.

* 73% received their diploma which was the highest graduation rate of all institutions.

* Since leaving BCIT, 88% sought employment related to their training.

* As to current activity, 57% were employed full-time while 15.6% were unemployed. This was the third highest unemployment rate of the 17 institutions.

* Of those who were unemployed, 53% had been employed full-time since leaving BCIT. 25% reported being laid off while 35% cited no related jobs as the main reason for presently being unemployed.

* Of those who were presently, or had been employed, 22% found a job before leaving BCIT, while 20% said it took them 1-4 months to find a job.

* Greater Vancouver was the main job location (60%).

* 52% reported that their job was definitely related to their training.

* The main industry in which employed was services (27%), primarily health care, followed by manufacturing (13%).

* The primary occupation was reportedly in science (20%), followed by clerical (16%).

* 78% reported that their training was useful or very useful in performing their job.

* As to availability of desired courses at BCIT, 79% were satisfied.

* 68% were satisfied with the adequacy of instruction while 74% were satisfied with the subject content of courses.

* 73% were satisfied with the preparation received for chosen occupation.

* Lab facilities were rated as satisfactory (78%) as was the Library (87%).

* Satisfaction levels for program advising and career counselling were not as high (58% and 41% respectively).

* 36% were dissatisfied with job placement services (vs 44% satisfied). This is the highest percentage of dissatisfaction cited by BCIT students.

* As to the overall quality of the program, 81% were satisfied.

* 69% thought that ample jobs in their field would be available locally, the highest percent of any institution, though most (88%) would consider moving to find a job in their field.

* As to future educational plans, only 2% did not plan to take any further training. For the majority who did plan further training, 31% cited returning to BCIT, followed by 20% selecting UBC.

2. Night Sample (Part-Time)

* 57% responding were male, with 75% aged over 24.

* Main objective for attending was to improve existing job skills (34%), followed by to learn new job skills (22%).

* Educational goal was to complete a career/technical program on a part-time basis (53%), but only 29% had met their goal while 49% still hoped to.

* 77% were employed full-time while enrolled, primarily in a job related to their training.

* 66% had not completed the courses they had intended to take, which was the second highest non-completion rate of all institutions.

* Lack of adequate finances was the single most popular reason for non-completion (17%) followed by family obligations (16%).

* Since leaving BCIT, 64% sought related employment.

* As to current activity, 65% were employed full-time while 7.7% were unemployed.

* Of those unemployed, 30% had not been employed at all since leaving BCIT while 51% had been employed on a full-time basis. 31% reported that they had been laid off.

* Of those employed, 60% were still working in the job held while enrolled with 90% located in Greater Vancouver. 50% reported earning over $1800 per month which was the highest salary reported out of all institutions.

* 41% reported that their job was definitely related to their training. Of those who took an unrelated job, 24% cited inadequate training as the reason.

* The main industry in which employed was again services (33%), primarily health care.

* The primary occupation was reportedly clerical (30%), followed by science (13%).

* 78% reported that their training was useful or very useful in performing their job.

* As to availability of desired courses, 70% were satisfied.

* 78% were satisfied with the adequacy of instruction while 83% were satisfied with the subject content of courses.

* 65% were satisfied with the preparation received for their chosen occupation.

* Lab and Library facilities were rated as satisfactory by 65% and 69% respectively.

* Satisfaction levels for program advising and career counselling were not as high (54% and 41% respectively).

* An equal proportion were satisfied as were dissatisfied with job placement services (20% each).

* The overall quality of the program was rated satisfactory by 81%.

* As to future educational plans, only 2% did not plan to take any further training. For the majority who did plan further training, 63% cited BCIT, followed by 13% selecting UBC.

Review of Findings

The day and night BCIT samples were representative of the age and sex distributions of the full- and part-time student populations. Both groups cited completion of a career/technical program as their educational goal and both cited their main objective as the acquisition or improvement of job skills. These findings are comparable to the goals and objectives cited at initial entry in 1981. The day sample had the highest rate of goal attainment in the post-secondary, non-university system while most of the night sample had not met their goal but hoped to do so in the future. The day sample had the highest graduation rate in the system while the night sample had one of the highest non-completion rates. These discrepancies are understandable in light of the characteristics of the two samples. The day sample was primarily college age, pursuing training on a full-time basis and not employed while enrolled. The night sample was primarily adult age, employed full-time while enrolled and pursuing training on a part-time basis. It can be inferred that attainment of an educational goal was of a more immediate priority for the day sample, in order to learn the skills needed to acquire a job. Meanwhile the night sample, though intending to meet their educational goal eventually, already had the responsibility of a full-time job in addition to financial and family obligations. Of interest is the fact that that the majority of the night sample were still working in the same jobs held while enrolled and had an overall unemployment rate half that of the day sample, while drawing salaries double that of the day sample.

There was little difference between the two groups in levels of satisfaction with various aspects of BCIT. Those areas related to quality and content of education were rated as satisfactory by more than two-thirds of all respondents, while student services (counselling, job placement) received the lowest ratings from both groups. Finally, BCIT was identified as the institute of choice by 41% of all respondents, with 5% of respondents from every institution indicating BCIT as the institution where they hoped to enrol for further training.

Conclusions:

1. The conventional source population for full-time post-secondary education (age 18-24) has begun a prolonged decline, the duration of which is projected to be at least 10 years. Rising demand for participation in education, primarily attributable to high unemployment, may lessen or offset the impact on enrolment levels, but progressive declines can nonetheless be expected over the medium term.
2. Due to the current "echo baby boom" the post-secondary source population in British Columbia will reach an all-time high by the turn of the century.
3. The post-secondary source population and Grade XII enrolment are decreasing more rapidly in the Lower Mainland than in the balance of the province. This would indicate that greater provincial draw may be necessary to attain the desired enrolment levels at BCIT.
4. Full-time enrolment in provincial colleges and institutes reached an historical peak in 1983. Hereafter, system-wide declines are projected over the medium term. Intensified recruitment efforts and aggressive marketing may be necessary to maintain the current BCIT enrolment levels.
5. Despite recent decreases, part-time enrolment is projected to steadily increase over the medium term. Enhancement of part-time credit programs will enable BCIT to benefit substantially from these increases while weathering possible full-time enrolment declines.
6. As full-time participation by older age groups at BCIT has increased, so has participation by those most recently in the labour force. As long as unemployment rates remain high, this trend can be expected to continue.
7. Based on the results of a province-wide study of former career/technical students, BCIT is the provincial institute of choice. This reputation should enable BCIT to offset substantial declines in enrolment, irrespective of system-wide decreases.

THE ECONOMY

I. NATIONAL[1]

The so called "Great Recession" began in the third quarter of 1981 and ended in the fourth quarter of 1982. The recession was the product of the restrictive monetary policies adopted in Canada and the United States in an attempt to reduce high inflation. The result of these policies was historically high interest rates. In turn, these high interest rates began to affect consumer spending and residential construction. This, in conjunction with a decline in exports, signalled the start of the recession in Canada. Businesses began to reduce investments, run down inventories and lay off workers. The GNP fell by 6.5% while the unemployment rate rose from 7.4% to 12.7%. Capacity utilization in manufacturing dropped from 88% to 67% and corporate profits before taxes declined by over 60%. Rising expenditures, combined with declining revenues, resulted in a sharp increase in the deficits of federal and provincial governments. As the recession deepened, inflation began to fall resulting in lower interest rates. This, in combination with government housing programs, produced an upward movement in consumer spending and residential construction. By the first quarter of 1983, the recovery began.

In the first quarter of 1983, the economy grew by 1.6%, followed by 1.8% in the second quarter. Third quarter growth of leading economic indicators posted a gain of 2%, the best growth rate since the recession began. The biggest factor in the third-quarter growth was a $1 billion build-up of inventories, but this was mostly the result of forestry and metal industries overestimating the demand. Overall, there has been no widespread effort to rebuild stocks this year. Business investment is

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1 Sources: Conference Board of Canada, Quarterly Canadian Forecast (Medium Term Outlook), Applied Economic Research & Information Centre, Executive Summary, September 1983.

Statistics Canada, Current Economic Analysis, November 1983, 13-004.

still weak, having declined for the first six months of the year. Business spending on machinery is expected to remain below 1982 levels, while non-residential construction continues to be weak. Residential construction fell by 5.1% in the third quarter and housing starts dropped 41%. This has been attributed to the termination of the Canada Home Ownership Stimulation Program. Company profits have grown by 74% during 1983, with a 10.5% jump in the third quarter. The inflation rate has dropped to 4.9% with lower prices for imported goods reinforcing price moderation. Accordingly, personal spending for durable goods (cars, furniture, and appliances) has increased strongly. But, the recovery in consumer demand for semi- and non-durable goods has been relatively weak, reflecting the weak growth of wages. Even though labour income rose by 2.4% in the third quarter, wage rates have continued to deccelerate more rapidly than inflation. Meanwhile, unemployment is still high (10% - 11%), as are real interest rates (prime rate at 11%; mortgages at 13.4%).

Though the recovery has been more vigorous than expected, indications are that there will be a noticeable slowdown in the first half of 1984 (Table 8 and Chart 19). Weak real incomes, unemployment and rising interest rates are expected to create a downward trend in consumer demand.

Despite an upturn in company profits, businesses are not responding with investment and employment increases. Instead, emphasis has been placed on improved productivity and profit margins, with the result that output grew more rapidly than employment. High interest rates are said to be discouraging business investments, while encouraging the repaying of debt in lieu of increasing inventories and new hiring.

The continuation of high interest rates is precisely the reason that a slowdown in economic growth is expected. The fear of a return to high inflation dominates government policy and financial market expectations in Canada and the United States. This has resulted in relatively restrictive monetary and fiscal policies instead of the stimulative measures undertaken during past recoveries. As a result of such policies, nominal and real interest rates are projected to remain high.

TABLE 8

KEY ECONOMIC INDICATORS

MEDIUM TERM CANADIAN FORECAST

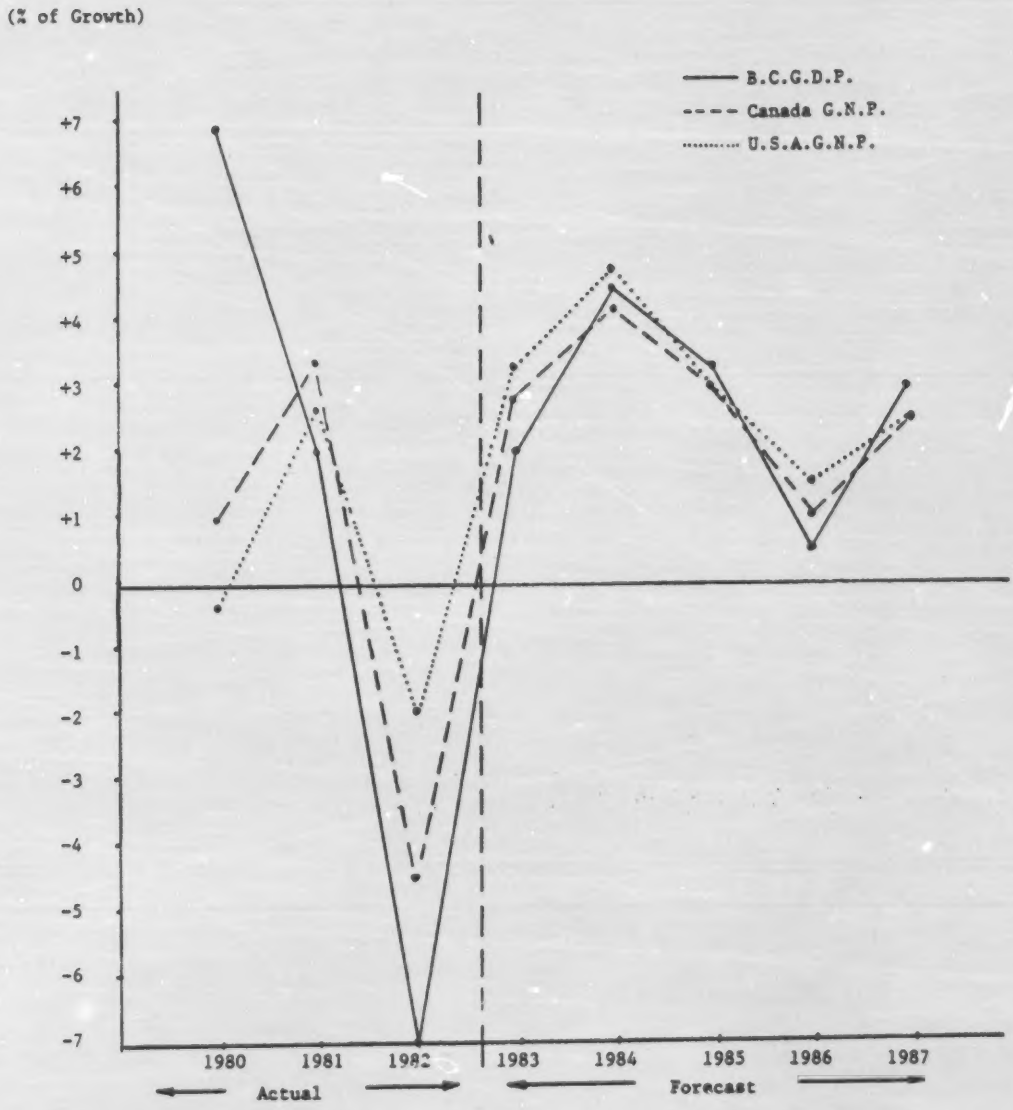
(Percentage of Change)

	1982	1983	1984	1985	1986	1987	1988
Gross National Product ($ 1971)	-4.4	3.0	2.7	0.4	0.7	2.8	2.9
Consumer Price Index	10.8	5.8	4.9	5.7	5.7	4.6	4.2
Total Employment	-3.2	0.5	2.8	1.4	0.4	1.4	2.4
Unemployment Rate	11.1	12.1	11.0	10.9	11.2	11.1	10.8
Average Weekly Wages	10.0	5.9	5.0	5.1	5.4	5.3	5.1
Real Average Weekly Wages-	-0.7	0.1	0.0	-0.6	-0.3	0.7	0.8
Private Non-Farm Productivity	-2.0	2.4	0.4	-0.7	0.6	1.9	0.7
Federal Gov't Balance ($ Millions)	-20502	-23122	-21685	-23297	-26848	-29277	-31090
Corporate Profits Before Taxes	-36.1	61.3	25.4	1.4	6.4	13.5	9.1
Housing Starts	-28.0	32.2	0.5	-8.4	4.0	18.9	15.4

Source: Conference Board of Canada, Quarterly Canadian Forecast, (Medium Term Outlook), September 1983.

CHART 19

REAL GNP/GDP GROWTH RATES
U.S., CANADA AND B.C.
1980-1987



Source: B.C. Ministry of Finance, British Columbia Economic Forecast, November 18, 1983

Meanwhile, population growth is slowing, government spending is declining, and taxes are being raised by all levels of government. This is expected to cause consumer spending and residential construction to grow at a relatively slow rate over the medium term. A reduction in export growth is also expected due to a slowdown in U.S. economic growth. While a sluggish recovery in non-energy investment is predicted, energy investment is expected to decline rapidly over the next few years. Overall growth in business investment is predicted to be weak.

The medium term outlook for the Canadian economy is, therefore, one of low inflation and relatively slow growth. It is predicted that significant underutilization of resources will continue. The GNP is projected to grow by only 2% over the 1983-88 period, while inflation drops to an average of 5%. Output will remain well below its potential level and the unemployment rate will stay high. Real interest rates will continue to remain high and will generally follow those in the U.S., though at a slower rate. In sum, the strength of the economy in the medium term will, to a great degree, be dependent upon the evolution of economic policy and its perceived impact in both the U.S. and Canada.

II. PROVINCIAL[2]

The recession in British Columbia bottomed out by the end of 1982 after a 17 month contraction. The growth rate for the real gross domestic product is estimated to be +2% for 1983, compared to a 7% drop in 1982 (Chart 19). The most noticeable improvement has been in the primary forestry and wood manufacturing sectors, where strong output growth has occurred in response to a surge in U.S. housing starts. As of September 1983, U.S. housing starts were up almost 75% from September 1982. For the first time in five years, the sawmill component of the industry is showing a real increase in output. Recovery in other areas of the industry has been mixed. Plywood production has increased gradually due to increases in Canadian housing starts, but output continues below capacity. Meanwhile, the recovery in pulp and paper has been very sluggish, primarily due to excess international capacity and a decline in prices.

Estimates of growth in 1983 for selected economic indicators reflect major improvements for some components and continued problems in other areas (Table 9). Unemployment has continued at record levels, with an estimated rate of 13.8% for 1983. This is one of the highest regional unemployment levels in North America. Bankruptcies have also continued at record highs, averaging 109 per month compared to 41 per month in 1981.

Employment has fallen again, by 1.5%. Retail sales had been expected to show substantial recovery in 1983, but in fact growth has been moderate. The year end estimate is for a 1.8% increase over 1982. Consumer confidence in B.C. has not yet returned to the marketplace. This caution is also reflected in the corporate sector. Though corporate profits are estimated to be up 25% in 1983, business investment is expected to be down more than 10%. As is the situation nationally, continuing high interest rates have had a negative affect on consumer and business spending despite the fact that inflation has fallen to 5.8% in Vancouver.

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2 Sources: B.C. Ministry of Finance, British Columbia Economic Forecast, Nov. 18/83

B.C. Central Credit Union, Economic Analysis of British Columbia, Economics Department, Vol. 3, No. 7, Nov/Dec., 1983.

TABLE 9

BRITISH COLUMBIA SELECTED ECONOMIC INDICATORS

ANNUAL RATE OF CHANGE

	1980	1981	1982	1983 (e)	1984 (f)
Real Gross Domestic Product	6.9	2.0	-6.0	2.0	3.5
Total Capital Expenditure	27.8	24.9	-15.5	-10.0	-5.0
Personal Disposable Income	14.3	15.3	8.9	7.0	6.0
Consumer Price (CPI)	9.4	14.3	10.5	5.7	5.3
Retail Sales	15.0	13.5	-1.9	1.8	8.0
Employment	5.5	4.7	-5.1	-1.5	3.0
Unemployment Rate	6.8	6.7	12.1	13.8	12.6
Help Wanted Index	8.8	40.8	-65.0	-25.0	35.0
Population	2.7	2.9	1.7	1.2	1.4
Housing Starts (Units)	37,546	41,585	19,807	23,000	27,000

e = estimate f = forecast

Source: B.C. Central Credit Union, Economic Analysis of British Columbia, Economics Department, Vol. 3, No. 7, November/December, 1983.

The economic forecast for British Columbia is integrally tied to the level of interest rates and the strength of the U.S. recovery. Optimistic forecasts are for interest rates to fall. The B.C. Central Credit Union is forecasting a reduction in the U.S. and Canadian prime lending rate by two hundred basis points, to 9% by mid-1984. Meanwhile, the provincial government and the Conference Board of Canada are forecasting the prime lending rate to be 11% in 1984, which is a continuation of the 1983 rate. These conflicting forecasts are based on discrepant perceptions as to U.S. monetary policy and financial market behaviour. Forecasts for lower interest rates are based on the expectation that inflation will continue to decline, while forecasts for higher rates are based on the fear of a return to high inflation. Even though inflation continues to moderate, a stimulative response (i.e. lowering interest rates) is not as likely as continued restraint, resulting in a slowdown in economic activity after 1984 (Chart 19). However, during 1984 the process of recovery should continue.

In British Columbia, corporate profits are expected to grow by 40% in 1984. Even so, business pessimism is anticipated to continue resulting in a further 5% decline in capital expenditures and continued high unemployment (12.5% to 13%). Modest improvement (+3%) is forecast for employment growth with the creation of 35,000 new jobs in 1984. Given that the labour force is projected to increase by an equivalent number, the new jobs created will do no more than maintain the status quo. Inflation is expected to drop slightly, averaging about 5%.

The primary forestry industry is forecast to be stronger in 1984 than in 1983. At this writing, not only have production levels for lumber increased but also prices. The demand in the U.S. housing market has rebounded again, following a six-month lull. Since B.C. lumber supplies 30% of the U.S. market, the improvement in the sawmill component has been greater than anticipated. Further growth is expected in 1984, though at a slower rate. Plywood production will remain below previous levels and prices will be low unless Canadian housing starts recover to the levels of the 1970's, which is unlikely to occur. The pulp and paper market is forecast to remain soft, though gradual improvement is anticipated.

The mining sector, which saw the greatest declines in growth in 1983, is generally not expected to show much improvement. Excess capacity, excess inventories and weak demand in world markets continue to plague the molybdenum, copper and lead industries. Aluminum markets should show some improvement, with demand linked to the pace of recovery. Generally, expansion of Third World mineral production will create tough competition for B.C. mineral exports in world markets over the next decade. The demand for mineral fuels (coal, gas and oil) has declined substantially and with it so have prices. B.C. mineral fuels, among the highest priced, face strong international competition. Decreases in export prices are expected to reduce total revenue.

The 1984 forecast for retail sales is optimistic, ranging from 8% to 10% growth. Whether or not this growth rate is realized is dependent upon a substantial increase in consumer confidence/spending. Continuing high unemployment rates and weak wage growth could continue to slow recovery in this sector.

Recovery in the tourism sector, B.C.'s second largest employer, has been lagging. Growth in 1983 was flat. Since tourism activity tends to reflect the general state of the economy, the outlook for 1984 is one of moderate improvement. However, real growth in the industry will occur in 1986 when the World Exposition opens. The expectation is for 15 million visitors during the 6 months of the Fair.

Conclusions:

1. By the first quarter of 1983, economic recovery was measurably evident, though primarily confined to strong gains in residential construction and in export demand. On the consumer level, recovery has been less conspicuous. Indicators are that the recovery will slowdown in the first half of 1984.
2. The medium term outlook for the Canadian economy is one of low inflation, high real interest rates, high unemployment, with the combined result of slow growth.

3. Recovery in British Columbia has been mixed and relatively sluggish. Much the same performance is forecast for 1984, with continuing modest improvement. Thereafter, a slowdown in economic activity is projected.
4. The primary forestry industry has registered substantial gains, with further, albeit slower, growth expected in 1984.
5. The mining sector has shown the worst performance and is not expected to show improvement in 1984.
6. The outlook for the retail sector is optimistic, but highly dependent upon consumer confidence. Performance to date has not kept pace with the national average.
7. Recovery in the tourism sector has been lagging, but the outlook for 1984 is one of moderate improvement. Real growth is not projected until the onset of Expo '86.
8. Historically, B.C. has exhibited some of the highest growth rates in the nation, capitalizing on its natural resource base. When world demand decreased radically, B.C.'s economy fell more rapidly than any other. Unless significant restructuring of the domestic economy occurs, a return to previous performance levels is unlikely.

THE LABOUR FORCE

I. The Unemployment Problem

Unemployment continues to be the most pervasive economic and social problem in the nation. As of November, 1983, 1.3 million people were unemployed in Canada, for an actual unemployment rate of 10.7% [1]. This is an improvement over a year ago, wherein the unemployment rate was 12.2%. Currently, 10.9% fewer people are unemployed nationally than in November, 1982. But, this improvement tends to be largely a reflection of increases in employment in Ontario. Employment has expanded by 5% over the past twelve months in Ontario, while unemployment has been cut by 25%. Manitoba also experienced some improvement, with a 4.3% increase in employment and a 19.2% decrease in unemployment.

Meanwhile, in British Columbia, the level of unemployment is at 13.8%. Though this is down from November 1982 (14.1%), it exceeds the 1982 annual average of 12.1%. In fact, only Newfoundland and New Brunswick have higher actual rates of unemployment than B.C. On the average, 8,000 fewer people were employed in British Columbia in 1983 than in 1982. Compared to November 1981, almost 100,000 fewer people are currently employed.

As the number of employed has dropped, the number in the labour force has increased (+1.2%) as has the number of unemployed (+15%). The average number of people out of work in B.C. in 1983 is estimated to be 190,000[2]. Job creation is the only factor which will improve this situation. When labour force growth exceeds employment growth, the result is increasing unemployment. Between 1976 and 1980, new jobs were created at a faster

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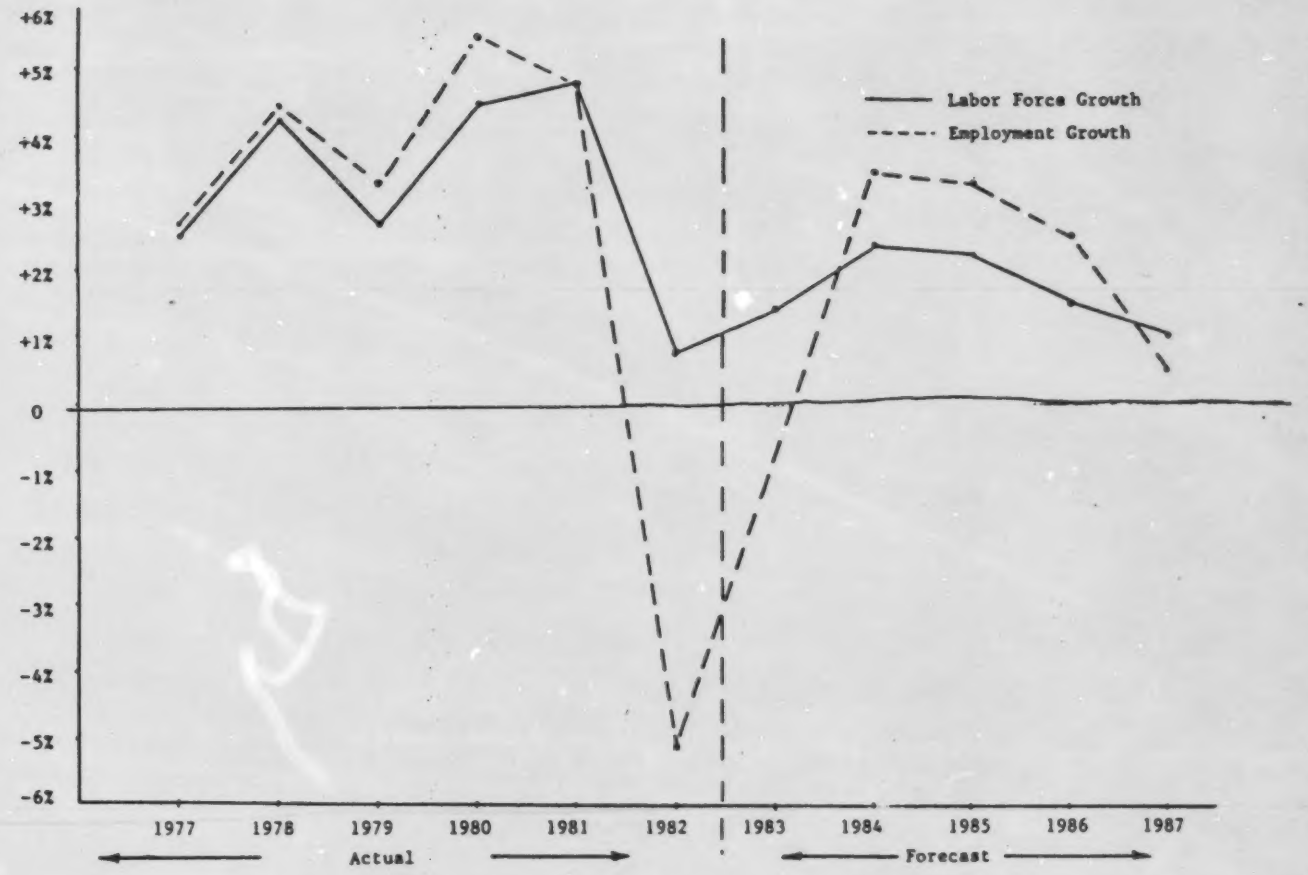
1 B.C. Ministry of Labour, B.C. Labour Force Statistics, November, 1983.

2 B.C. Central Credit Union, Economic Analysis of British Columbia, Vol. 3, No. 7, November/December, 1983.

CHART 20

B.C. LABOR FORCE AND EMPLOYMENT GROWTH RATES
1977-1987

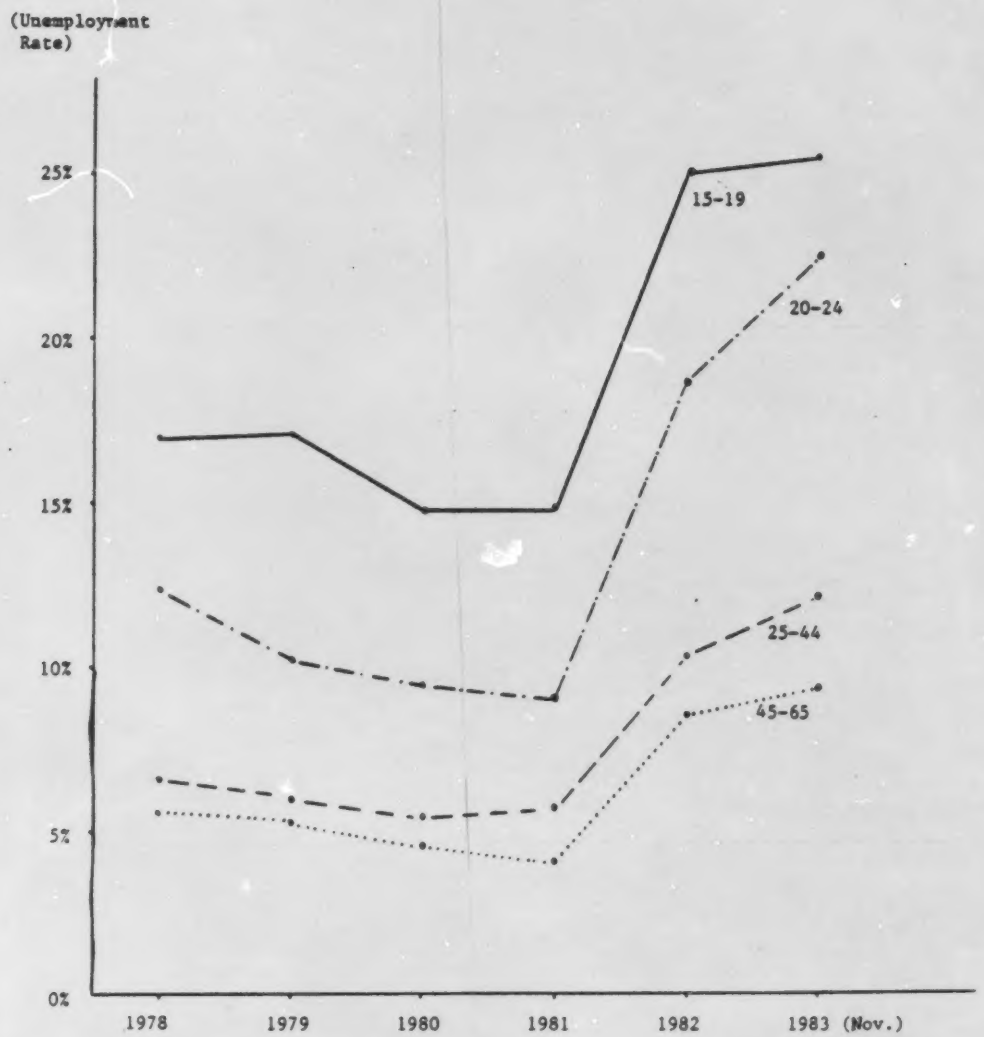


Sources: (1976-1979) B.C. Ministry of Labour, Labour Force Statistics, September, 1983.

(1980-1987) B.C. Ministry of Finance, Economic Forecast, November 18, 1983.

CHART 21

B.C. UNEMPLOYMENT RATE BY AGE GROUP
1978-1983



Source: Statistics Canada, CANSIM Data Base

rate than new entrants to the labour force (Chart 20). In 1981, employment and labour force grew at the same rate. Thereafter, in 1982, employment fell by 5.1%, while the labour force grew slightly (+0.7%), resulting in an over 80% increase in the number unemployed. In order to prevent further increases in unemployment, 2,500 new jobs will have to be created in B.C. each month during 1984. To accommodate new entrants to the labour force, 30,000 to 40,000 new jobs must be created annually. Though the forecast of 3% growth in employment in 1984 meets this job creation level, it will do little to improve the unemployment situation. This projected increase of 35,000 new jobs will just absorb the expected 33,000 new entrants to the labour force.

Of particular concern is the extent of unemployment in the younger age groups. Over 25% of those aged 15 - 19 in the labour force are out of work (Chart 21). In fact, of the 183,000 currently unemployed, 38% are under the age of 25. In absolute terms, this constitutes about 70,000 young people who are actively seeking jobs that don't exist.

This impact is reflected in BCIT 1982-83 graduate placement statistics. According to the Canada Employment Centre on campus, vacancies were down by 49% from 1981-82, while full-time career placements for graduates were down 30%[3]. Additionally, career placements for alumni were down 57% and undergraduate summer placements were down 14%. Only part-time placements recorded an increase, up 67%, bringing the overall placement rate up to -18%. Those technologies having the highest number of employment opportunities were Electrical Engineering and Marketing Management. The greatest declines in the number of opportunities were in Mechanical and Civil & Structural, followed by Forest Resources and Forest Products.

The problem of unemployed youth has been recognized as severe. In the December, 1983 Throne Speech, Prime Minister Trudeau pledged to establish a $1 billion youth employment fund to create jobs for 500,000 youths.

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3 English, Beverley, 1983 Annual Report of the Canada Employment Centre-On-Campus, Employment & Immigration Canada, November, 1983.

In new job creation money (above and beyond existing appropriations) this sum is reduced to $400 million total, with $266 million targetted for youth to establish 90,000 jobs. Since nationally there are over 1/2 million youth (under 25) seeking jobs, it is not expected that significant change will be reflected in the unemployment rate.

II. Job Creation and the Labour Market

Given that the provincial budget is characterized by restraint, the government is not expected to be the major job creator that it was in the past. Neither is the primary resource sector expected to be the source of new jobs in the future since technological change has eliminated much of the potential job creation. Both mining and forestry are becoming more automated. In the past twenty years, these sectors have increasingly been employing a smaller percentage of the province's labour force[4] (Chart 22). For example, in the logging component the number of people employed dropped by 10% from 1971-81. Forestry related manufacturing industries have shown slower growth rates than any other industry. But, in turn, the manufacturing and resource sectors had the greatest increases in productivity. Since an increase in productivity means an increase in the efficiency of production, the number of new jobs created is less than would otherwise have been if efficiency had not been increased through technological improvements. In sum, the resource sector is shrinking as an employer and is forecast to continue to do so at an accelerated rate.

New jobs in B.C. over the past twenty years have primarily been created in the tourism and service industries. Between 1961 and 1981, 80% of employment growth was in the service sector. Currently, one third of all jobs are in the business and personal services industry (which includes tourism), employing 100,000 more people than the entire goods' producing sector. Though more jobs will continue to be created in the service sector, the greatest opportunity for new job creation is said to be in finance, high technology, and secondary manufacturing. Actual occupational demand projections for British Columbia are not yet available, therefore a definitive forecast cannot be herein provided.

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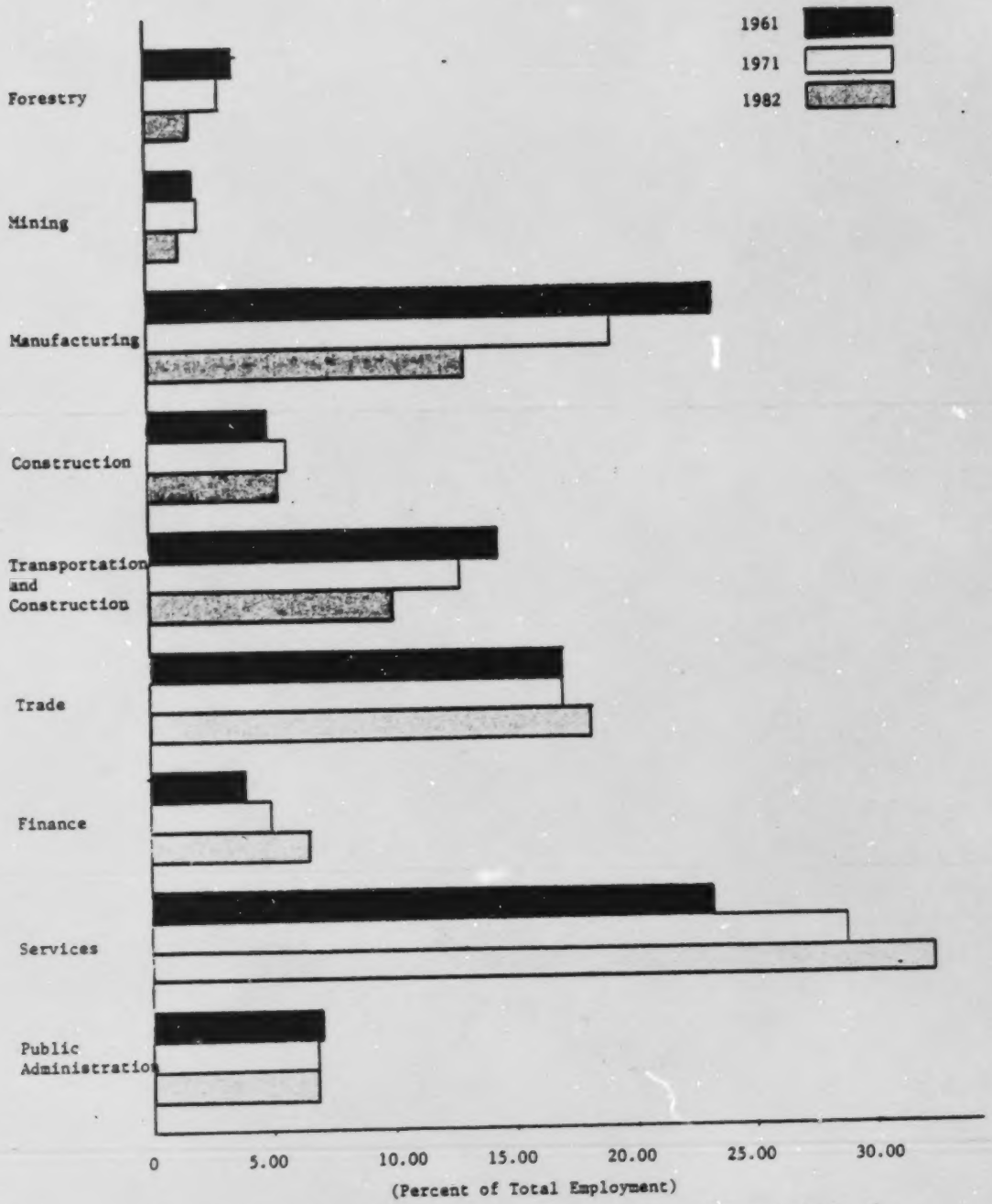
4 B.C. Central Credit Union, Economic Analysis of British Columbia, Vol. 3, No. 2, Reprinted September, 1983.

CHART 22

COMPOSITION OF B.C. EMPLOYMENT BY INDUSTRY
(PERCENT OF TOTAL)



Sources: (1961 and 1971) B.C. Central Credit Union, Economic Analysis of British Columbia, Vol. 3, No. 2, September 1983

(1982) Ministry of Labor, B.C. Labor Force Statistics, September 1982

III. Manpower Shortages and Training Needs

A. Western Canada Manpower Training Study - 1981

The Ministers of Education and Health in British Columbia, Alberta, Manitoba, and Saskatchewan commissioned a study in 1981 of future health manpower needs in Western Canada. Though data contained in the report are out of date (results were not released until 1983), the content is relevant to numerous BCIT technologies within the Health Division.

Recommendations which have some impact on BCIT are summarized below, by occupational category[5].

1. Chiropody - study recommends establishment of one training program in Western Canada; Health Division recommends BCIT prepare proposal to offer program.
2. Prosthetics & Orthotics - study recommends that BCIT not increase only existing program above present level; BCIT concurs.
3. Public Health Inspector - study identifies immediate and ongoing requirement for practitioners and recommends that BCIT be designated as the Western Canada School responsible for certificate level education; BCIT perceives present intake as adequate, but that consideration should be given to one year of advanced study at BCIT.
4. Health Records - study recommends that current enrolment in programs for Administrators be maintained and that technician level programs be phased out; BCIT recommends technician program be maintained at current level.

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5 BCIT Health Division, Review of Recommendations - Western Canada Health Manpower Training Study, 26/08/83.

5. Medical Laboratory Technologist - study recommends increasing emrolment in full-time programs and maintaining enrolment in refresher course; BCIT agrees.
6. Physiotherapy Assistants - study identifies potential shortfall of physiotherapists; BCIT recommends developing a training program for Physiotherapy Assistants.
7. X-Ray Technicians - study recommends maintaining existing programs and developing a refresher course; BCIT concurs.
8. Respiratory Technologist - study recommends expansion at Cariboo College; BCIT suggests initiating training program.
9. Registered Nurses - study predicts shortage and recommends an increase in output be attained through reducing attrition rates; BCIT concurs and recommends extensive student counselling by faculty be continued to facilitate low attrition.
10. Psychiatric Nursing - study recommendations same as for R.N. (above); no action recommended by BCIT pending discussions with Douglas College.

B. Forestry Education Needs in B.C. Until 2000 A.D.[6]

The Ministers of Forests and of Universities, Science & Communications established the Forestry Education Task Force to estimate staff requirements in the B.C. forest industry by the year 2000 A.D. The Task Force concluded that there must be intensification of management of B.C.'s forests to meet demands and that more staff will be needed to do so. The Task Force forecasts that between 1988 and 2015, an increase in forestry staff must be achieved in the following positions:

1. Professionals - to double, from 2,000 to 4,000.
2. Specialists - to increase from 250 to 650.
3. Technologists - to triple, from 3,000 to 10,000.

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6 Forestry Education Task Force, Forest Research Council, Richmond, B.C., July, 1983.

To meet these demands, the Task Force recommends that:

1. B.C.'s post-secondary institutions plan to graduate the staff required;
2. staff and facilites in institutions be expanded to enable them to graduate annually 100 with bachelor's degrees (up 45%), 45 with master's or doctoral degrees (up 165%), and 340 with technologist diplomas (up 50%);
3. where demand exceeds manpower, required levels should be obtained by out-of-province recruitment, in-service training and special programs;
4. forestry staffing needs should be reviewed periodically.

BCIT's response is that Forest Resources recommends that no action be taken now for additional graduates. The rationale is based on the current tight job market in the forestry industry due to economic conditions. Forest Resources has the capacity to increase output by 30 per year when demand is apparent. Planned program emphasis is toward management specialties. Since the Task Force report is based on intensive output in the forestry sector, BCIT's cautious response is justified. Currently, graduate job placement in forestry - related occupations is down and the forestry industry is shrinking. An incremental approach, responding to demand as warranted, is the logical course of action.

Conclusions:

1. The unemployment problem remains critical. Nationally, the annual unemployment rate is forecast to remain above 10% over the medium term.
2. B.C. has one of the highest regional unemployment levels in North America. The provincial annual unemployment rate is forecast to remain about 11% over the medium term.
3. Career placements for BCIT graduates will remain substantially below historical levels, given that one-fourth of those aged under 25 are out of work.

4. Employment in the primary resource sector will continue to fall behind other sectors. The potential for new job creation is expected to be in tourism, finance, secondary manufacturing, high technology, and non-government service industries. BCIT graduates should be in a more favourable position than most young job seekers, since they are being equipped with the skills required within these industries. A dynamic approach to curriculum content which anticipates technological advances will continue to produce graduates with marketable skills.

POLICY

I. NATIONAL POLICY

A. Government of Canada Education Support Programs[1]

The Federal Government currently groups its range of education support under 10 headings, each of which represents a national objective. The first four objectives reflect the view that large-scale federal support, provided in cooperation with the provinces, is an important element in developing and maintaining a strong, accessible post-secondary system throughout the country. The following four focus on national and international challenges in such areas as research, official languages and employment policies. The last two objectives address specific federal responsibilities to dependent groups (military, prison inmates, Indians) and as a public service employer. The objectives are as follows:

1. General support objectives: to help maintain and strengthen the post-secondary capacity throughout Canada required to respond to the individual learning and development aspirations of Canadians and the needs and opportunities of Canadian society.
2. Educational opportunity objective: to facilitate the access of all qualified and interested Canadians to formal learning by reducing barriers due to socioeconomic status or to membership in groups that are not fully served by the existing educational system, and to reduce financial hardship resulting from participation in the education system.
3. Mobility objective: to minimize any barriers that might prevent Canadian post-secondary students, teachers and graduates from studying, training or working wherever they wish in Canada.

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1 Secretary of State, Support to Education by the Government of Canada, Minister of Supply & Services Canada 1983, Cat. No. S2-120/1983.

4. Employability objective: to promote a post-secondary capacity, in those areas of post-secondary activity related to the provision of occupational skills required by the Canadian labour market, which is responsive in providing Canadians with the opportunity to obtain the qualifications required for occupations critical to national economic growth and for occupations characterized by a high degree of inter-regional and international mobility.
5. Research objective: to encourage the development of researchers and research knowledge and capacity in the post-secondary education system, consistent with the general research and development needs of Canadian society or in order to provide solutions to problems arising in areas of national concern.
6. Official languages in education objective: to provide opportunities for Canadians to increase their knowledge of Canada's official languages through formal learning and for members of the minority official language group in each region to be educated in their own language.
7. Canadian understanding, citizenship and cultural indentity objective: to increase through formal learning the knowledge and understanding Canadians have of themselves and their environment, with particular concern for the cultural diversity of Canada, and to stimulate and maintain a sense of Canadian citizenship.
8. International relations objective: to promote Canada's international interests in matters relating to education including: provision of links between the education systems of Canada and of other countries; promotion of a better knowledge abroad of Canada and its people; encouragement of international studies in Canada and of international joint research and scholarly activities; and provision of policies and programs relating to foreign scholars and students in Canada.
9. Federal direct schooling objective: to develop knowledge, skills and critical capacity among groups whose education is a federal responsibility, through financing and/or management of schools and other educational establishments.

10. Needs of the federal government as an employer objective: to promote an adequate supply of personnel with skills, knowledge and capacities needed for an effective public service, including appropriate official language capabilities.

Some of the major programs and activities in the field of education which the federal government currently administers in support of these objectives are of relevance to BCIT. Under the Post-Secondary Education Financing Program (EPF), unconditional payments are made to provincial and territorial governments in the form of a cash entitlement and a tax transfer. Cash payments are provided through the Secretary of State and are calculated to ensure the total transfer to each province is equal per capita. The Department of Finance is responsible for the reduction of federal taxes and the fiscal equilization payments associated with the tax transfer. Total transfer payments provide approximately 75% of the funding for higher education in the provinces. In fiscal year 1982-83, British Columbia received a total of $412 million under EPF, 47% of which was in cash payments.

Student Assistance is an important area of federal support. The Canada Student Loans Program is designed to make post-secondary education more accessible and to facilitate geographic mobility in the choice of institutions. Loans are provided to students with demonstrated financial need. Students apply through the provincial government and the loans are negotiated at designated financial institutions. Six months after terminating full-time studies students make repayment arrangements. Recent amendments have increased the weekly loan limits from $56.25 to $100.00 plus extended loans to needy part-time students. Additionally, provisions have been made for relief of debt for those who become permanently disabled and for relief from interest payments to unemployed graduates for up to 18 months at any time within the life of the loan. Furthermore, many federal departments and agencies provide scholarships, bursaries, fellowships and studentships to pursue courses of study relevant to departmental aims. Finally, students may deduct tuition fees from their income, if the fees are over $100.00 and are paid to an accredited institution, plus deduct $50.00 expenses for each month in the year during which they were in full-time attendance.

The Canada Employment & Immigration Commission assists students with short-term and part-time employment. The Student Summer Employment Program makes funds available to voluntary organizations and local governments to hire students to carry out projects. Summer student internships with government departments and private sector are also subsidized. Canada Employment Centres are operated on campuses in over 80 post-secondary institutions, assisting more than 100,000 students annually.

The National Training Act provides for CEIC to operate adult vocational training programs that support the training and upgrading of workers needed in high demand occupations. The three component programs of the Act are:

1. The National Institutional Training Program pays tuition fees and provides income support for occupational training. Both entry-level and upgrading courses comprise the Skills Training activity while Apprenticeship Training provides classroom instruction in provincially operated apprenticeship programs. Since these activities have been targetted for vocational programs of, primarily, one year in duration in B.C., BCIT students have not benefitted from this program.
2. The National Industrial Training Program provides financial assistance to employers who train individuals, and includes General Industrial Training, Critical Trade Skills Training, and the Women in Non-Traditional Occupations Program.
3. The Skills Growth Fund (SGF) was established to increase the capacity for training in critical occupations. SGF provides capital for facilities and support for developing training materials and techniques. BCIT has been successful in having three program proposals approved for $3.2 million in funds under SGF - Robotics, CAD/CAM, and Microelectronics. These programs are in the process of being developed and will operate within the Engineering Division, building on the existing electronics, computer and mechanical engineering technologies.

The Honourable Serge Joyal, Secretary of State, recently emphasized that the Government of Canada remains committed to the support of a strong and accessible system of post-secondary education[2]. In this context, he cited the federal responsibility to ensure that post-secondary institutions have the capacity to respond to all reasonable demands for education, despite the necessity for fiscal restraint. Support of the public policy goal of full accessibility for all interested and qualified students is founded in the belief that increased participation will bring economic payoffs through the production of the skilled manpower needed for sustained economic recovery. The Secretary of State cited the federal government's intention to increase spending on all programs of post-secondary support as a means of achieving this goal. In doing so, he emphasized the necessity for federal and provincial cooperation to ensure that scarce resources are being used as effectively as possible and noted the constitutional difficulties in developing appropriate mechanisms of cooperation. Instead, he suggested concentrating on informal means of cooperation via advisory and research bodies. He cited the recent suggestions of Dr. Horowitz, President of the University of Alberta, for a national conference and the establishment of an independent Canadian Council of University Education. Despite the lack of references to colleges and institutes (hopefully due to the audience for this address), the federal concern about provincial cut-backs in post-secondary education is obvious. Due to the interdependence of federal and provincial programs and the relative autonomy of the provinces with respect to post-secondary policies, one can hope that the provinces choose to support the goals and objectives of the federal programs which stress an accessible, relevant, high quality post-secondary capacity.

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2 Notes for an Address, by Hon. Serge Joyal, Secretary of State, National University Week, 1983; October 4, 1983.

B. Skill Development[3]

In December 1982, the Task Force on Skill Development Leave was established to examine skill development leave as a mechanism for the retraining, upgrading and updating of Canadian workers. The problem being addressed was the impact of rapid technological change and radical employment restructuring on the focus of education. It has been determined that the focus must change to one of lifelong learning, not something one does only during youth. Education programs must attempt to equip students with the skills required for meaningful employment in a changing world, plus accommodate the ongoing training needs of working Canadians to acquire new, relevant life skills. Accordingly, the Task Force was asked to study and prepare options and mechanisms for the use of educational or training leave, or time, for the purpose of acquiring or upgrading skills appropriate to effective participation in working life.

As an instrument for consultation, Volume II, Policy Options for the Nation, sets forth a number of options in support of a lifelong learning strategy for Canada (Table 10). These options fall into six major categories - changes to existing policies and programs, changes to legislation and collective agreements, tax changes, new institutions and funding sources, pilot projects and joint action, and support mechanisms for participation. In order to assess the strengths and weaknesses of the policy options put forth, conferences were held with business, labour, the education community and government authorities. The results of the consultative process are included in Table 10, wherein each sectors' consensus response is listed. In general, the widest range of support came from the educators, as would be expected. Across the board there was little

3 Adapted from: Skill Development Leave Task Force, Learning a Living in Canada, Employment & Immigration Canada, 1983; Cat. No. MP43-134/1983E.

support for options in the category of new institutions and funding sources. Both employers and the governments were basically opposed to changes in legislation and collective agreements, while such changes were generally supported by workers and educators. Changes to existing policies and programs and support mechanisms for participation had more support consensus from all four sectors than the other categories. It is obvious that a variety of options for lifelong learning are available through existing mechanisms. The challenge now is to put the viable/acceptable options into action.

TABLE 10

SKILL DEVELOPMENT LEAVE POLICY OPTIONS

OPTIONS	WORKERS	EMPLOYERS	EDUCATORS	GOVERNMENTS
Inventory of Existing & Planned Programs within CEIC	Support (5)	Yes		Generally Acceptable
Nat. Training Act		Yes	Support	Partially Acceptable
Canadian Occupational Projection System		Yes		
Thrust Fund Expansion		Maybe	Support	Generally Acceptable
Upgrading the Highly Qualified		Maybe		
Can. Student Assistance Program		Yes	Support	
Unemployment Ins.		No	Support	Generally Acceptable
The Dual System	Support (5)	No		
Part-Time Students	Support (5)	Yes	Support	
Work & Learning Resource Centre		No		
Educare	Support (2)	No	Support	Totally Unacceptable
The Right to Learn	Support (1)	No	Support	
ILO Convention 140	Support (1)	No		
Recommendation 148 of the International Labour Organization		No		
Earned Time Off	Support	No	Support	Unacceptable to most, Acceptable to some

Continued....

TABLE 10

OPTIONS	WORKERS	EMPLOYERS	EDUCATORS	GOVERNMENTS
Earned Entitlement	Support (2)	No	Support	Unacceptable to most, Acceptable to some.
Incentives for Employees		No		Partially Acceptable
One-in-Five Option		Yes	Support	
Vouchers		Maybe	Support	Totally Unacceptable
Skill Development Credit Plan		No	Support	Generally Unacceptable
Levy-Grant Fund	Support (4)	No	Support	Partially Acceptable
Registered Educational Leave Savings Plan		Yes	Support	Generally Acceptable
Tax Incentives for Corporations		Maybe	Support	
National Council For Work and Learning		No		
National Recurrent Education Bureau		No	Support	Generally Unacceptable
Human Resources Development Corp.		No	Support	Generally Unacceptable
Learning Councils		No		Generally Unacceptable
Continuing Education Units		No		
Training Fund		No		
Program Development Fund		No		
Matched Grants		No		
Sector Training and Education Councils	Support (4)	No		

Continued....

TABLE 10

OPTIONS	WORKERS	EMPLOYERS	EDUCATORS	GOVERNMENTS
Federal-Provincial Joint Action		Yes	Support	Generally Acceptable
Demonstration Projects		Maybe	Support	
No Option		No		
Affirmative Action		Yes	Support	Partially Acceptable
Overcoming Barriers to Equitable Participation in Education and Training	Support (3)	Yes	Support	
Development of Adult Educators	Support (3)	Yes	Support	
Education Delegates	Support (3)	Yes		

C. Technology Policy

In May 1983, the Honourable Donald J. Johnston, Minister of State for Science and Technology and for Economic Development, presented a technology policy for Canada in the House of Commons[4]. Central to the establishment and implementation of a technology policy is the recognition that it cannot be created in isolation. To be effective, technology development must be integrated with economic, fiscal, industrial, social and science policies. To this end, the Prime Minister has established a Sub-Committee of Cabinet on Technology Development which will be dedicated to achieving the integration of policy elements, and to advancing technology development in all sectors.

The broad objectives for technology development in Canada are:

1. To strengthen the Canadian economy through the creation, application and diffusion of state-of-the-art technologies.
2. To manage the process of technological development so that Canadians are aware of both the opportunities and the problems that might arise.
3. To ensure that the benefits of technology development are shared equitably among all Canadians in every region.
4. To encourage a social climate that places a premium on scientific and technological excellence, curiosity and innovation.

To achieve these objectives, the federal government set aside $700 million in the budget for technology development, in addition to the $3 billion that was already budgetted for technology support in the 1983/84 estimates. Above and beyond these appropriations are forgone tax revenues of $200 million for current R & D expenditures, plus $185 million in new tax changes and proposals.

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4 Minister of State Economic Development Science & Technology, A Technology Policy for Canada, Speech, May 3, 1983.

In allocating these funds, the federal government has formulated detailed objectives which relate to the interaction of technology within each sector of society. These objectives and new initiatives supported by the federal investment are as follows:

1. Business Sector

   a) To encourage an overall business environment that supports investment, innovation and enterprise.

      * Tax incentives for R & D have been enriched. Tax benefits to industry will exceed $200 million in 1983. Changes to Investment Tax Credit will benefit small firms, and broaden the application of tax credits. The process for R & D tax deduction has been simplified by an increased tax credit for research and development, contributing a further $100 million in industrial incentives. Further, corporations would choose not to use the R & D incentives can pass on these benefits to outside investors.

   b) To ensure that current industrial support programs for technology development continue to be effective and that Canadian firms have access to the most productive, up-to-date technologies available.

      * Over the next two years, $20 million will be spent to expand the National Research Council's Industrial Research Assistance Program, particularly for technical services to small and medium sized businesses.

2. Labour Sector

   a) To ensure that all Canadians have the opportunity to benefit from technological advance and that those workers who may be adversely affected are given adequate support during any necessary adjustment period.

      * In order to make training and educational opportunities available to Canadians who wish to participate actively in the technological future, an additional $155 million has been allocated for human resource development programs. In 1983, funds for skills development in occupations for significant economic growth are $1.2 billion. The Canada Student Loans Act has been expanded by $60 million.

b) To enourage labour-management mechanisms at all levels to encourage joint planning for technological change.

* A $10 million fund has been approved for the next two years for business and labour to establish a centre for productivity and employment growth.

3. University Sector

a) To foster a core of excellence within the university structure which conducts research relevant to industry while maintaining the universities' capacity for fundamental research.

* Funding for the Natural Sciences and Engineering Research Council will be increased by $27 million over the next two years.

b) To strengthen joint university/industry research and technology efforts.

* An additional $9 million is being expended on current university/industry programs for core research in areas of specialization and for the training of the research manpower required by industry.

4. Government Sector

a) To ensure that R & D in federal laboratories supports industry's needs in the context of economic objectives.

* The creation of a non-profit corporation which would conduct R & D in the fields of telecommunications, space technology, informatics and computer sciences has been proposed.

* In November 1983, a task force was established to review the government's intramural science and technology activites and to make recommendations on whether government research is relevant to industry's needs. It will also study the industry support programs, R & D policies, and how to improve university/industry cooperation.

* $22 million has been committed to implementing a National Biotechnology Strategy which will support research networks, concentrating on using biotechnology to improve the use of Canada's resource base and industrial development.

* A $7.5 million fund has been established to develop a National Microelectronics Design Network. This will provide a university-based computer-linked network of stations for Very Large Scale Intergrated Circuits. Thirty universities will participate, working closely with industries in the microelectronics field.

b) To promote public awareness of the activities, principles and methods of science and technology.
   * An annual fund of $1.5 million has been established to promote awareness.
   * Conferences on the effective management of technological change are to be held, involving all the various sectors.

c) To ensure that each region takes the best possible advantage of its technological opportunities.
   * The Special Recovery Capital Projects program has allocated $290 million over the next four years to establish 15 new or expanded research and training facilities. Projects are expected to serve the forest products, fisheries, agri-food, manufacturing and mining industries.
   * An additional $180 million has been allocated for the procurement of high-technology electronic and communications equipment.

In promulgating these new initiatives, one of Donald Johnston's chief concerns has been to establish a policy which will bring the Canadian technology potential into the main stream of national economic development[5]. He has recognized the necessity for all levels of government to move towards well-defined central economic development goals which take into account the interests of all concerned. To quote from his speech to the House of Commons - "The federal government will be working closely with the provinces to achieve the synergism and harmonization of objectives, policies and programs which will really get Canada moving again."

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5 Ministry of State, Science & Technology Canada, Science Notes, Winter 1983, Vol. 2, No. 1.

It is precisely this issue that is raised in a recent study sponsored by the Science Council of Canada[6]. Regional differences and provincial economic autonomy have created barriers to the formulation of a national effort to restructure industry. In order to compete effectively in world trade, significant economic structural change is perceived as necessary. With an economy that is highly differentiated from region to region, the provinces have become more aggressive in promoting the industrial expansion of their own economies. This provincial territoriality is said to pose a potential threat to the future of the Canadian economy as an integrated whole. A successful national industrial policy is contingent upon the collective actions of the two levels of government focussing on the problem of industrial change in a coherent and a mutually reinforcing manner, according to the study. Interprovincial conflict over industrial policy and unproductive competition need to be resolved and intergovernmental collaboration needs to be encouraged. This will require that the federal government take a more effective and active leadership role in industrial policy making, inclusive of targetting industrial programs to regional problems or opportunities. Regional perspectives must be integrated into both the making and implementing of economic policy. Bilateral approaches to industrial policy by the federal government are said to offer the greatest opportunity for cooperation.

It is, therefore, concluded that what is required is for the federal government to authorize an existing department to take the responsibility for both industrial policy and federal-provincial relations strategy. It appears that Mr. Johnston is, in fact, in agreement with this philosophy, but the institutional mechanism is not in place. The policy structure and fiscal support exist but concerted action, not only of each sector but of each level of government, will be central to economic prosperity.

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6 Jenkins, Michael, The Challenge of Diversity, Industrial Policy in the Canadian Federation, Science Council of Canada, Background Study 50, August 1983, Cat. No. 5521-1/50E.

II. PROVINCIAL POLICY

On July 7, 1983, the Social Credit government introduced a highly controversial legislative package. Re-elected on a platform of economic restraint, the government's 1983/84 budget legislation is essentially an unparalleled austerity program. The restraint legislation, encompassing both fiscal and social matters, focussed national attention on British Columbia. Within the province, special interest groups and organized labour joined forces, under the auspices of Operation Solidarity, to oppose the legislation. By November 1983, this culminated in a province-wide confrontation between the government and labour and community groups, and a two week public sector strike ensued. Further escalation of work stoppages ceased when Premier Bill Bennett and Solidarity representative Jack Munro reached an agreement concerning, primarily, the procedures for implementing the restraint measures. It is the government's contention that the agreement reached was, in fact, negotiated acceptance of the original legislative package.

The government's commitment to economic restraint began with the onset of the recession. In February of 1982, Premier Bennett introduced the Compensation Stabilization Program, the strictest wage control program in the country. As the recession deepened, the world market demand for B.C.'s natural resource products diminished causing revenues to shrink and the government deficit to grow to over a billion dollars.

The current budget legislation is a reflection of the government's philosophy that public sector restraint is essential to private sector recovery[4]. It has been pointed out that despite the emphasis on government restraint, spending is forecast to increase at double the rate of last year[5]. Furthermore, while the budget promises to reduce the "excessive burden of government on the economy", taxes are being increased by over $200 million.

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4 Government of the Province of British Columbia, Restraint & Recovery: The Next Steps, December 1983.

5 B.C. Central Credit Union, Economic Analysis of British Columbia, August 1983, Vol. 3, No. 4.

According to the government, its legislative package is intact. The public service workforce is being reduced by 25%. Accordingly, the amount of office space required will be reduced by 10% and government fleet vehicles by up to 20%. The Compensation Stabilization Program has been extended indefinitely, providing for wage adjustments in the minus five to plus five percent range. Government employees will receive no pay increase in 1983/84 and two stages of 3% and 1% in 1984/85. Despite these cuts, combined with only a 5% increase in inflation, departmental budgets are rising 11.3% over 1982/83 expenditures.

Operating revenues are projected by the government to increase by only 4.6% this fiscal year, inclusive of the $200 million in new taxes. Most of this increase (excluding federal contributions) is estimated to be generated by taxes, particularly corporate income tax and sales tax. The sales tax has been increased from 6% to 7%, which the government estimates will provide an additional $170 million per year. The new sales tax on restaurant meals over $7.00, and on long distance phone calls, are expected to increase taxation revenue by $60 million a year. All together, businesses will pay $100 million more in taxes to the provincial government. Given that economic recovery has just begun, it may not be strong enough to absorb the effect of an extra tax burden.

Whether this restraint legislation will attract private sector investment and development remains to be seen. As previously discussed in the economic section, though corporate profits are increasing, investment and employment are not. The budget contains no stimulative measures by government to create jobs and the targetted tax concessions for business do not offset the general increases. The government's contention is that economic recovery can only come about by vigilant restraint, yet continued restraint policies have been identified as the primary cause of slow growth - not exactly the key to prosperity. Austerity is the reality of provincial policy, the long-term impact is unknown.

Conclusions:

1. Provincial government cut-backs in post-secondary education funding run counter to the federal government's goal of ensuring that post-secondary institutions have the capacity to respond to all reasonable demands for education. Though EPF funding was increased by 8% in 1983/84, the B.C. provincial government did not pass along the increase to the post-secondary system. This highlights the need for a mechanism of cooperation between the two levels of government for the purpose of coordinating policies and priorities, thereby determining the effective allocation of resources.
2. Due to the rapidity of technological advances, the focus of education must change to one of lifelong learning which provides for both the acquisition and the upgrading of skills appropriate to effective participation in working life.
3. Inherent to the national policy on technology development is technology's essential contribution to economic growth. Through joint ventures, such as Discovery Parks, the innovation and application of technology will not only be relevant to industry's needs, but also provide training in skills required by industry. BCIT's strong links with the private sector, combined with its reputation for excellence, emphasize the Institute's role in making available to British Columbians the opportunity to benefit from and participate in the technological future.
4. The 1983/84 provincial budget is essentially a response to two consecutive billion dollar deficits. The government contends that the taxpayer can no longer afford to support the size and cost of the public sector, resulting in cuts to health, human resources and education services. Whether in fact the restraint legislation results in private sector recovery has yet to be determined. Indications are that the public sector will experience continuing restraint. Educational institutions will have to depend less on government support and be more aggressive in seeking funds from private sources.

EXCELLENCE IN EDUCATION

I. The Problem[1]

Mediocrity in education is threatening the future of North America. Both in Canada and the United States there is concern that well-educated, strongly motivated competitors throughout the world are overtaking North America in commerce, industry, science and technological innovation. Other nations are matching and surpassing our educational attainments. Knowledge, learning, information and skilled intelligence are the new raw materials of international commerce. Education is the necessary investment for success in the "information age".

Mediocre educational performance goes beyond world market competition and material benefits - it limits the progress of society and detracts from an individual's ability to secure gainful employment and to manage their own lives. International comparisons of student achievement have revealed progressive deterioration of scores in comparison with other industrialized nations, most notably Japan and the Soviet Union. Children are not being provided with the intellectual tools needed for the future. The new basics must include communication and higher problem-solving skills, and scientific and technological literacy.

For the first time in history, the average secondary and post-secondary graduate of today is not as well educated as the average graduate of 25 or 35 years ago. A broad committment to excellence in education via reform of the educational system is required to arm the children of today with the skills of tomorrow. Dramatic changes will be necessary in the extent of student participation in the methods and quality of teaching, in the preparation and motivation of children, in the content of courses, and in standards of achievement.

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[1] Sources: Chronicle of Higher Education, A Nation at Risk: The Imperative for Educational Reform, Report by the National Commission on Excellence in Education, May 4, 1983.

National Science Board Commission on Precollege Education on Mathematics, Science & Technology, Educating Americans for the 21st Century, National Science Foundation, September 12/83.

II. The Concept

Excellence means performing on the boundary of individual ability in ways that challenge personal limits, in school and in the workplace. Excellence characterizes an educational institution that sets high expectations and goals for all learners, then assists students in reaching them. The goal is to develop the talents of all to their fullest. Not only does this require a commitment to academic excellence in formal schooling in youth, but also a commitment to lifelong learning to provide for the retraining needs of those whose skills have become obsolete. In essence, what is needed is a coherent continuum of learning, dedicated to the ideal of academic excellence, with opportunities for all.

III. The Courses

Declines in educational performance have been attributed to inadequacies in the educational process. First, curriculum content has become too generalized, to the extent that secondary-school curricula no longer have a central purpose. High school graduation requirements have become increasingly lax. Courses in mathematics, science and technology are insufficient in quantity and inferior in quality.

Secondly, the level of knowledge, abilities and skills that secondary and post-secondary graduates possess are deficient. While homework has decreased, grades have risen and student achievement has declined. The time spent on specialized science and math subjects has decreased to minimum levels. Post-secondary institutions have lowered admission standards, reducing the number of specific high school course requirements. Textbooks are being "written down" to even lower reading levels. Expenditures for textbooks and instructional materials have declined dramatically. Time spent on school work has decreased and is often used ineffectively. The teaching of study skills is haphazard.

Finally, not enough of the academically able students are being attracted to teaching. Teacher preparation programs need substantial improvement. The professional working life of teachers leaves much to be desired and a serious shortage of teachers exists, particularly in math, science and technology. Resultingly, approximately half of the newly employed math and science teachers are not qualified to teach these subjects.

IV. Recommendations

A. Secondary schools graduation requirements must be strengthened. All students should be required to take at least three years of math and science, including one-half year of computer science. Elementary school should provide earlier, increased and more effective instruction in mathematics, science and technology. New and more diverse curricula materials are needed.

B. More rigorous and measurable standards, and higher expectations, for academic performance and student conduct must be adopted. Colleges and universities should raise their admission requirements, particularly as relate to science and math course prerequisites. Textbooks should be upgraded and updated to assure more rigorous content. New instructional materials should reflect the most current applications of technology.

C. Significantly more time must be devoted to math, science and technology throughout elementary and secondary grades. This will require the lengthening of existing school day/year. Instruction in effective work and study skills should be introduced in the early grades.

D. Top priority must be placed on retraining, obtaining and retaining teachers of high quality and providing them with a work environment in which they can be effective. Expert non-school resources should be employed to solve the immediate problem of the shortage of math and science teachers. All teachers should have specialized training in their instructional field plus be computer literate. Finally, appropriate compensation and career laddering should be made available to teachers so as to attract the most highly qualified.

E. Since government has the primary responsibility for supporting the educational system, it should provide for these reforms in its educational policies and fiscal planning. To quote from the report of the National Commission on Excellence in Education - "Excellence costs. But in the long run mediocrity costs far more."

V. The Canadian Perspective

The Science and Education Committee of the Science Council of Canada is conducting a three year study on the health of science education, particularly in elementary and high school[2]. To date, researchers have analysed provincial policies and guidelines for science teaching, surveyed more than 4,000 teachers and examined the quality of science textbooks currently in use. Interim results indicate that science courses in Canadian schools need extensive upgrading to prepare students for their future in a high technology society. It has been determined that there is almost no tie-in between science in the classroom and technological applications in the outside world. This has serious implications in that training in the sciences is becoming an important job qualification. Students who are unaware of the impact of science and technology will be unprepared to participate in the high-technology future.

BCIT representative, Sid Todd, attended the Science Council conference held in British Columbia as a part of this study. A total of 12 such conferences are being held throughout the nation for the purpose of stimulating discussion and identifying problems in science education. Though recommendations have not been finalized, two major needs were identified. First, there is a need to increase the number of trained and specialized science teachers in the provincial school system. Second, science teachers need to be given the opportunity to meet with industry representatives for the purpose of understanding the application of science in the workplace. These and other recommendations will be forwarded to the Ministry of Education when finalized.

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2 Vancouver Sun, School Science "out of touch", March 9, 1983.

Comparable conclusions were reached in 1978 and 1982 by the B.C. Science Assessment Team[3]. In the most recent study, 80,000 students in grades 4, 8 and 12 and 1,850 teachers took part. Grade 4 results indicate that pupils are learning certain basic science processes well, that knowledge of concepts may be under-emphasized, and that higher level thinking is being adequately developed. The amount of time given to science in the primary grades was perceived as inadequate.

Grade 8 results reflect that students are leaving elementary school with an adequate knowledge of basic science concepts, with an ability to apply this knowledge in simple situations, and with well-developed skills in at least some basic processes. These pupils were found to have inadequate knowledge of the nature and utility of science and less than satisfactory ability in scientific reasoning.

Grade 12 performance was described as discouraging. In none of the areas assessed were students performing well. Students did not have adequate knowledge of basic science concepts, could not use some of the central processes of science adequately, and did not apply scientific knowledge well.

The major findings from the teacher questionnaires are as follows. The science background of elementary school teachers was found to be weak, with 42% feeling less than adequately prepared. Junior secondary teachers were adequately prepared in the biological sciences, but not in the physical or earth/space sciences. Senior secondary school teachers did feel adequately prepared to teach science. Most teachers felt that their pre-service training was inadequate for teaching science.

Elementary school teachers reported problems with equipment and materials of poor quality. There also were a lack of storage and preparation facilities and suitable classrooms for teaching elementary science.

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3 This section adapted from: The 1982 B.C. Science Assessment, Learning Assessment Branch, B.C. Ministry of Education, Hugh Taylor, Editor.

Facilities were found to be inadequate in many junior secondary schools. Teachers at all levels reported that science reading materials are less than adequate in both quality and quantity. Once again, elementary teachers were found not to be spending the recommended time in teaching science. There was a trend toward increasing specialization in teaching science at the secondary level, but not at the elementary level. The need for extensive in-service training was expressed by nearly 50% of all teachers surveyed.

Of the activities performed in science classrooms, pupils designing their own experiments was the least frequent activity at all levels. Elementary school teachers reported that they lacked sufficient materials to teach their program. The junior secondary program has been improved, particularly in Grade 9, and further improvement is expected with the introduction of a new curriculum. However, one problem was the lack of time spent in teaching earth science. In the senior secondary program, Biology 11 and 12 courses are causing problems due to out-of-date or inappropriate texts.

Since quality begins in the classroom, the area of teacher education, both in-service and pre-service, was singled out as that of highest priority. Accordingly, the primary recommendations address this issue. To wit:

Recommendation 1

that the Program Implementation Branch of the Ministry of Education coordinate the design, development and delivery of in-service programs for teachers which will focus on the following areas of need:

- how to teach science processes and critical thinking skills;
- the development of an adequate background of science knowledge in areas stressed in the curriculum, in areas of weakness for elementary teachers, and in the physical, and earth/space sciences for junior secondary teachers;
- how to safely teach science;
- how to teach safety to pupils.

Recommendation 2

that the following actions be taken with respect to the pre-service training of teachers:

- the Faculties of Education should revise teacher education programs as needed to ensure that:
  - (i) all pre-service elementary teachers experience science study to a minimum of a 3-unit course or equivalent at the university/college level, and
  - (ii) all pre-service elementary teachers take a course in science teaching methodology
- the Faculties of Education should give greater emphasis to each of the techniques and topics identified by teachers to be most inadequately emphasized in their pre-service training
- the Ministry of Education should revise certification guidelines to reflect the above.

Further recommendations of lesser priority are as follows:

Recommendation 3

that the Ministry of Education establish safety standards for school science classrooms, and provide funds for school districts not only to conduct surveys of the science safety equipment in schools where science is taught, but also to correct deficiencies that may be discovered through such surveys. (This recommendation is repeated from the 1978 Assessment.)

Recommendation 4

that the Curriculum Development Branch of the Ministry of Education establish a Senior Secondary Biology Revision Committee to re-examine all aspects of the senior secondary biology curriculum.

Recommendation 5

that school districts:

- evaluate the form of science coordination within each school and establish some form of school-level coordination where none now exists;
- not currently providing science coordination appoint or designate a qualified individual or individuals to be responsible for coordination and leadership of the science programs within the district.

Recommendation 6

that school districts:

- investigate the potential for converting some existing elementary general classrooms into rooms with adequate science facilities;
- examine elementary schools for ways to utilize available space so that central storage and preparation space is available for science teaching;
- attempt to provide for adequate ventilation, storage space for volatiles, increased general storage space for equipment and materials, increased preparation space and increased space for storage of pupil projects where these are needed in schools;
- examine the quantity and quality of the materials and equipment used in their science programs, and make a determined effort to effect improvements where these are necessary, especially in elementary schools and small junior secondary schools;
- encourage school libraries to purchase an adequate supply of science reading materials in both elementary and secondary schools.

Recommendation 7

that, wherever possible, school districts and administrators avoid assigning teachers with little science background to teach science in junior secondary grades. Where teachers must be reassigned outside their specialty, provisions should be made for retraining.

Recommendation 8

that school administrators and teachers follow the time allocations given for science instruction in the Administrative Handbook.

Recommendation 9

that teachers and school librarians cooperatively explore the upgrading of print materials in libraries and classrooms at both elementary and secondary levels.

Recommendation 10

that junior secondary teachers give greater time emphasis to earth science topics.

Recommendation 11

that science teachers:

- ensure that pupils understand safe procedures appropriate to their level;
- give pupils more practice in presenting results in symbolic forms (especially graphs) and in interpreting such forms;

- give extensive time (particularly in elementary school) and emphasis to measurement and quantification skills and to the use of the metric system;
- give pupils in upper elementary grades and secondary schools adequate experience in analyzing variables and designing controlled experiments;
- give more emphasis to teaching the practical applications of science knowledge and to using that knowledge in new situations.

Conclusions

1. There have been absolute declines in the educational performance of elementary and secondary school students both in Canada and the U.S.A. High school graduates are leaving school with an inadequate level of knowledge in science and technology. The basic causes have been attributed to the lack of qualified teachers, particularly in science, inadequate time spent teaching specialized subjects, and less than adequate instructional materials, including textbooks. Unless concerted action is taken to improve the educational process, students will not be equipped with the skills necessary to function in a technological-scientific age.
2. The lack of an adequate background in science among Grade 12 students in B.C. has functional implications for BCIT. If this trend continues, there will be fewer qualified applicants coming from secondary school. This could result in an increased demand for preparatory programs as well as higher attrition rates.
3. It has been said that no amount of post-secondary remediation will make up for poor foundations[4]. On this basis, it is essential that those working in the higher education system assert the urgency of better student preparation with local school boards and the Ministry of Education.

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4 Larkin, Paul A., Science, Math Way to High Tech, Community & Junior College Journal, April 1983.

THE POST-SECONDARY SYSTEM

I. Provincial Legislation[1]

As part of the public sector legislative package, revisions for the post-secondary education system were introduced in Parliament by the Minister of Education on July 7, 1983. Though as yet unproclaimed, the College and Institute Amendment Act, 1983, proposes administrative changes to create a leaner and more efficient system.

Bill 20 revises the provisions for appointments of members of boards of colleges and institutes. The amendment reduces the minimum number of board members to 5, all of whom are appointed by the Lieutenant Governor in Council. All references to terms of appointment and representation have been deleted. Board decisions concerning programs or courses to be offered or cancelled at an institution are now subject to the policies and directives of the Minister of Education.

One of the most substantial changes in the Act is the dissolution of the Occupational Training Council, the Academic Council, and the Management Advisory Council. Accordingly, most of the powers of the councils have been transferred to the Minister of Education. Individual institutions will now submit annual budget proposals directly to the Minister instead of through the councils, and the Minister will be responsible for allocating funds to the institutions. Additional discretionary powers provide that the Minister may:

a) require an institution to provide informaton and proposals in a form satisfactory to the Minister,
b) require an institution to develop or provide a service to another institution or the Minister,

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1 Bill 20, College & Institute Amendment Act, 1983, Honourable Jack H. Heinrich, Minister of Education, Legislative Assembly of British Columbia.

Bill 19, Institute of Technology Amendment Act, 1983.

c) require an institution to establish accounting and information systems he considers necessary for this Act,

d) require institutions to avoid unnecessary duplication in the courses offered,

e) establish articulation committees to advise the Minister on the equivalence of courses given at one institution or university as compared to courses given at another institution or university,

f) require an institution to participate in the work of an articulation committee,

g) require an institution to accept, as the equivalent of a course of instruction taught at the institution, a course of instruction taught at a university or another institution which the Minister has decided is equivalent, and

h) establish committees consisting of members of boards, principals, and employees of institutions and other persons.

In essence, these amendments centralize in the Ministry of Education administrative control over post-secondary education in the province.

Bill 19, the "BCIT" Act, continues the Institute with a board of governors consisting of 5 or more members appointed by the Lieutenant Governor in Council. The previous legislation provided for 8 members appointed by the Lieutenant Governor in Council, 3 members to be elected by the academic advisory committees, 1 member elected by faculty, 1 member elected by non-academic staff, 1 elected by the student council and 1 elected by the alumni association. Therefore, both the method of appointment and constitution of the board of governors have been revised. Terms of appointment have been deleted as have references to community representation.

Section 5, which establishes the powers and the duties of the board, has been amended to provide for ministry control over courses and programs to be offered or cancelled at the institute. Board determinations concerning courses and programs are to be subject to the policies and directives of the Minister.

II. Ministry of Education Policy

A. Mission, Goals & Objectives

The System Mission, Goals & Objectives, as promulgated by the Ministry of Education, became official on May 4, 1983. Subsequently, the Ministry developed a preliminary position paper on issues emerging from institutional five-year plans and the Mission, Goals & Objectives document. Issues of particular relevance to BCIT are as follows[2]:

1. Concerning cooperation between institutions - OLI and BCIT are expected to cooperate in open technical education, with OLI being the primary delivery agent.
2. Priority programs - Those to be maintained at the present level of activity over the next five years are
   a) electronics/information processing/computer
   b) engineering
   c) resource-related programs of forestry and agriculture.

   Those to be increased over the next five years are
   a) health Programs
   b) TRAC
3. Technological programming
   a) Less emphasis on new programming and more on redesigning existing programs.
   b) More compentency-based work and modularization.
   c) Colleges should arrange brokering of BCIT technological programs, and technology programs of universities and other colleges.
   d) No degrees will be awarded.
   e) Length, status and certification of technological programs will be reviewed in four or five years.

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2 Ministry of Education, Ministry Preliminary Position on Issues Emerging From Institutional Five-Year Plans and System Mission, Goals & Objectives.

4. Institute role in providing provincially mandated programs
   a) Coordinating role rests with ministry
   b) Institutes to provide leadership in delivery and development of designated education programs

B. Formula Funding[3]

1. Current Proposal

The "Progress Report Re: College/Institute Formula Funding" July 27, 1983 summarizes the current situation of the formula, including the proposed factors. The formula has not yet been finalized, however, it is unlikely to change in substance unless the test runs yield totally unacceptable results. It is more likely that minor modifications will be made to ensure the formula does not violate provincial requirements or the objectives and characteristics previously articulated by the Council of Principals.

The formula under consideration is quite complex. It will be based on dollars per FTE students (Full Time Equivalent). For the educational portion, the $/FTE will be multiplied by weights for programs and duration. Further, the basis for calculating FTEs will be uniform. For support, both enrollment (FTE) and a different form of duration will be included, but not the program weighting, assuming support is independent of program weights. These factors will be multiplied by a factor for economy of scale where applicable. The dollar value for the instructional unit will be derived from the total instructional budget divided by the total number of FTE in the system (based on 1982/83 experience).

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3 Prepared By: Andrew, Norah, Director, Institute Budgets & Analyses, November, 1983.

One other element worth emphasizing is the phase-in process which has variously been described in terms of years and percent. One proposal calls for a three-five year phase-in, and another limits the percentage of change to ± 10% in each year.

This formula is currently being tested. The results will be reviewed by the joint committee, and revisions made accordingly.

It is also worth reiterating that the formula is intended as a method of funding distribution. It is not intended to alter the absolute dollars available for distribution, but instead to allocate, or reallocate, available dollars on a more equitable basis. Accordingly, funding will flow from higher cost to lower cost institutions to achieve some equilibrium in the funding allocation among the institutions. In practice, this may result in over funding some and under funding others. This issue was explored at a recent College of Principals meeting, where considerable dismay was expressed at the prospect of adding funding without expecting productivity gains. This potential outcome is only alluded to in point 4 of the Progress Report, which states "Also, the degree of change resulting in any given institutions' level of funding will be reviewed to determine whether sound objective reasons can be cited for the change." In apparent response to this issue, a productivity factor has now been added to funding distribution, so that the operating budget for the entire system of Colleges and Institutes will be reduced by 5% in each of the next three years.

2. Potential Impact to BCIT

Various analyses have been performed by BCIT Staff to determine the potential impact of the proposed formula on BCIT funding, compared to present levels. These analyses have been seriously limited because the formula is not yet final and because the base unit, the dollars per FTE, is not yet available. However, based

on the proposed factors, we estimate that funding to BCIT will be significantly reduced under the formula. To understand how and why, consider the following factors in relation to BCIT's operation.

a) FTE, which is a prime component, is calculated by dividing the number of hours taken by the number of hours required for a program (annually), eg:

(i) $\frac{\text{780 hours taken by the student}}{\text{780 hours required by the program}} = 1 \text{ F.T.E.}$

(ii) $\frac{\text{585 hours taken by the student}}{\text{780 hours required by the program}} = .75 \text{ F.T.E.}$

This obviously results in unequal FTE, since one FTE can, and does, represent a wide range from approximately 600 to 1,300 annual hours. To compensate, weightings are attached to each FTE in a program which reflect standard, approved variances for program complexity and duration.

b) Program weights have been calculated by considering three elements:

i) Class size and class size ratio: An optimum class size of 30 was arbitrarily selected and applied to the full range of programs resulting in class size ratios of 1 for programs in the 30 class size range, up to 3 for programs with class sizes of 10 (the ratio is inversely proportional, i.e. 30/30 = 1, 30/20 = 1.5, 30/10 = 3). In general, the class size ratio the most influential of the three elements, is not unlike BCIT's, except that options often have smaller class sizes than provided for in the formula.

(ii) Supplies costs: these were based on system-wide (all Colleges and Institutes) averages of costs.

(iii) Proportion of subject (technology) courses and service courses (Math/English and Science) in a program: These were also based on system-wide averages and tend to favour the less specialized first year courses, especially where the subject weight is higher than service course weights and the second year enrollment is significantly higher at one institute than the system average.

c) Duration of a program: These have been calculated as system-wide medians, including both hours per week and weeks per year. These system medians are the approved durations for each program and are, in several instances, lower than the required hours for BCIT programs. Where a BCIT program has an average duration of 1050 hours annually, the approved duration might only be 650 hours so that the duration factor is 1.1 (650/600) rather than 1.8 (1050/600) for this program.

d) Support funding for both instruction (Educational Leave, Program Development, Deans/Department Heads) and general support (Library, Student Services, Administration and Facilities): These will be calculated on average system-wide costs per FTE which are lower than BCIT's in general. BCIT has a larger financial commitment to these activities than the other Colleges and Institutes. Further, the only weighting is a limited duration factor based only on whether programs are 8 months (weight of 1), 9 months (weight of 1.1) or 10 months (weight of 1.2). This means that the unequal FTE discussed above in item #1 is only partially offset by the limited duration factor for support.

The formula is not yet final and there have already been changes to the original structure as a result of BCIT input. For example, educational computer support, lab costs and service course weights are being, or will be, treated more favourably for technological programs. Further negotiations are still underway and may also result in changes that will benefit technological education.

Until the formula is finalized and the dollar value per FTE established, the potential impact can only be estimated. However, as the foregoing illustrates, the known factors do have serious implications to BCIT's future funding levels.

C. Program Mix[4]

Based on projections of course registrants, as presented in college and institute five year plans, the Ministry compiled system totals per program area to illustrate changes in program mix ratios from 1982/83 to 1987/88 (Charts 23, 24 & 25). There is a visible shift towards increases in career technical programs in the provincial college and institute system. For colleges, increases in vocational programs are projected to occur, while institutes project an increase only in career technical programs with a decrease in vocational programs.

Chart 26 presents, for each institution, the absolute change projected in the number of F.T.E.'s (excluding C.E.) enrolled in career technical programs over the next five years. BCIT's estimated increase of just under 2,000 F.T.E.'s is by far the greatest volume of increase, seven and a half times that of the College of New Caledonia, which has the next highest volume of increase.

Changes in program mix are partially a reflection of provincial priority programs and programs relating to nationally designated occupations. Registrant increases in career technical courses are projected for Health (+19.3%) and for Electronics/Information Processing/Computer (+10.4%), while a decrease is expected in other courses. BCIT plans a 15% increase in Electronics/Information Processing/Computer registrants and a 49% increase in Health by 1987/88. BCIT registrants are expected to make up almost 100% of system increases in the Health group and 80% of system increases in the Electronic/Information Processing/Computer group. Whether expressed as F.T.E.'s or as course registrants, BCIT students comprise more than 50% of provincial system totals for career technical programs.

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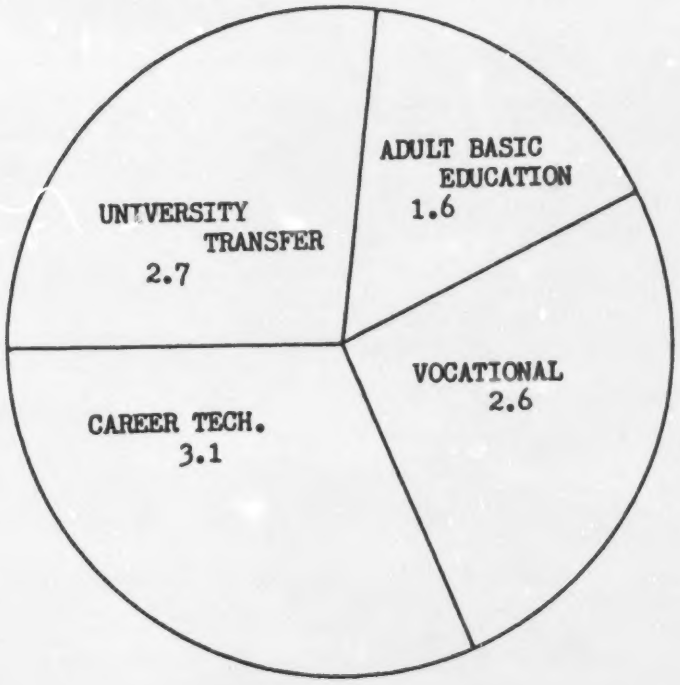
4 Ministry of Education, General Introduction: System Totals From 1983-88 Plan Appendices

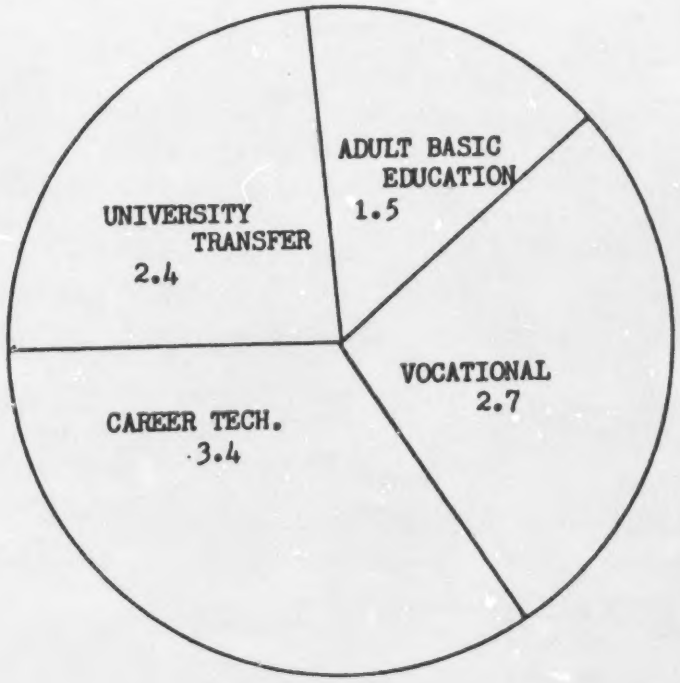
CHART 23

Program Mix Ratios for the Province

1982/83 and 1987/88



1982/83



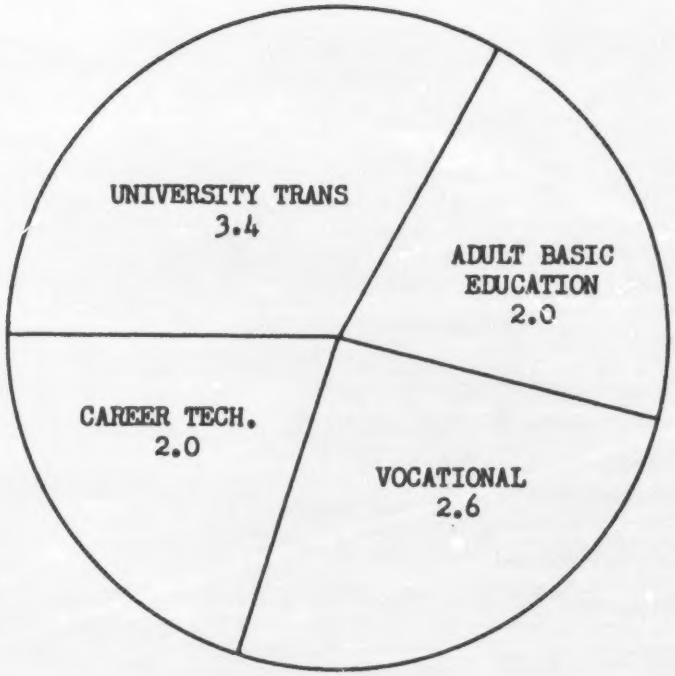
1987/88

Source: B.C. Ministry of Education (see Footnote 4)

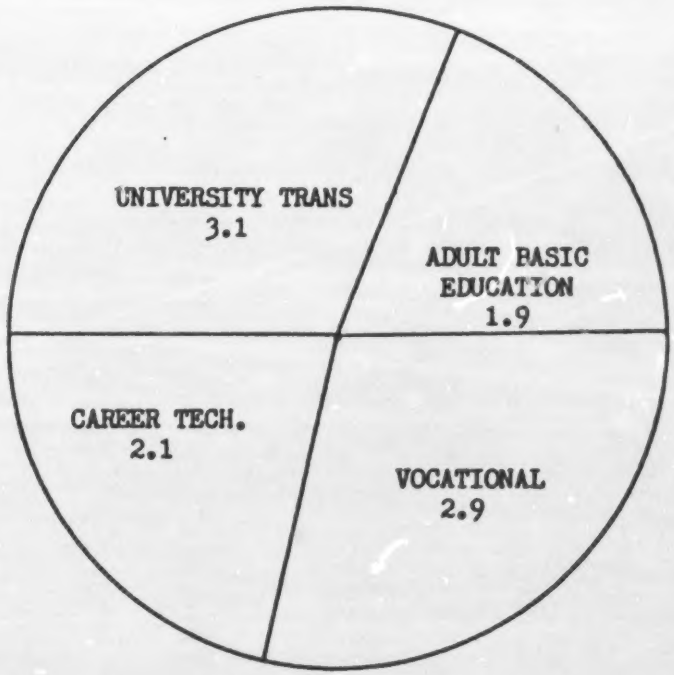
CHART 24

Program Mix Ratios for the Colleges

1982/83 and 1987/88



1982/83



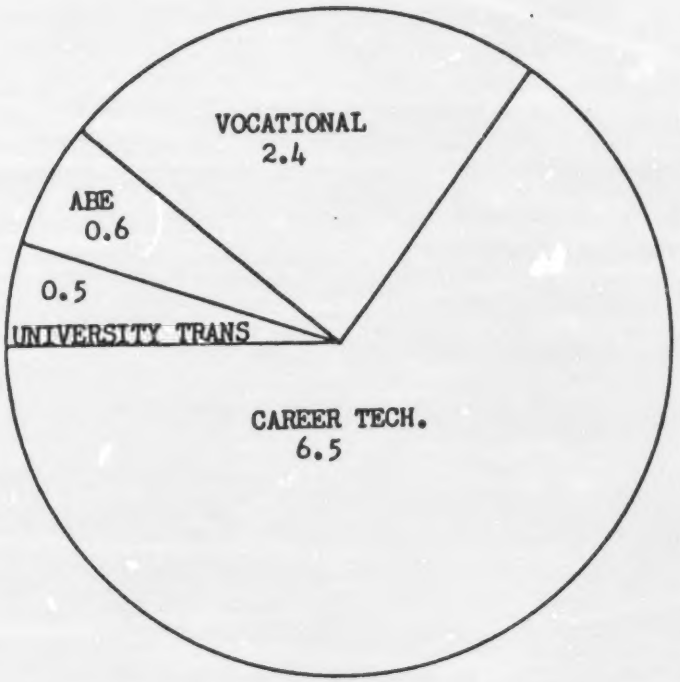
1987/88

Source: B.C. Ministry of Education (see Footnote 4)

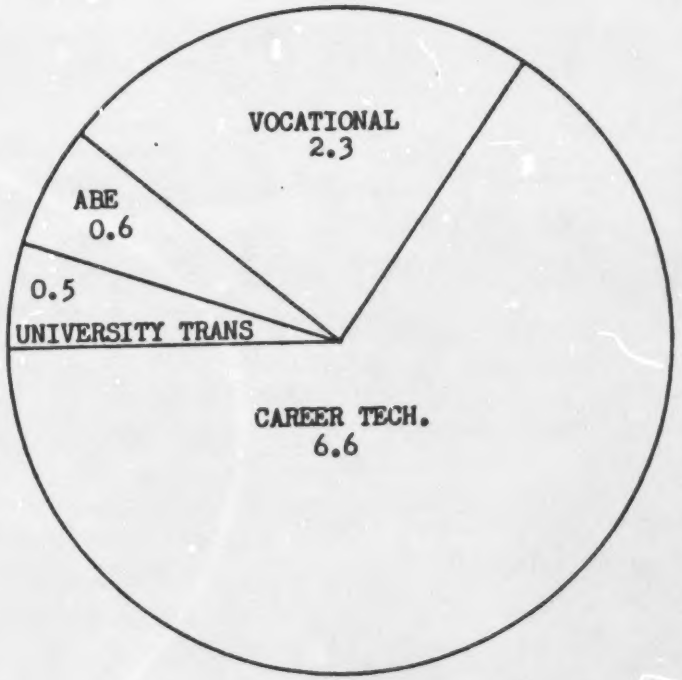
CHART 25

Program Mix Ratios for the Institutes

1982/83 and 1987/88



1982/83

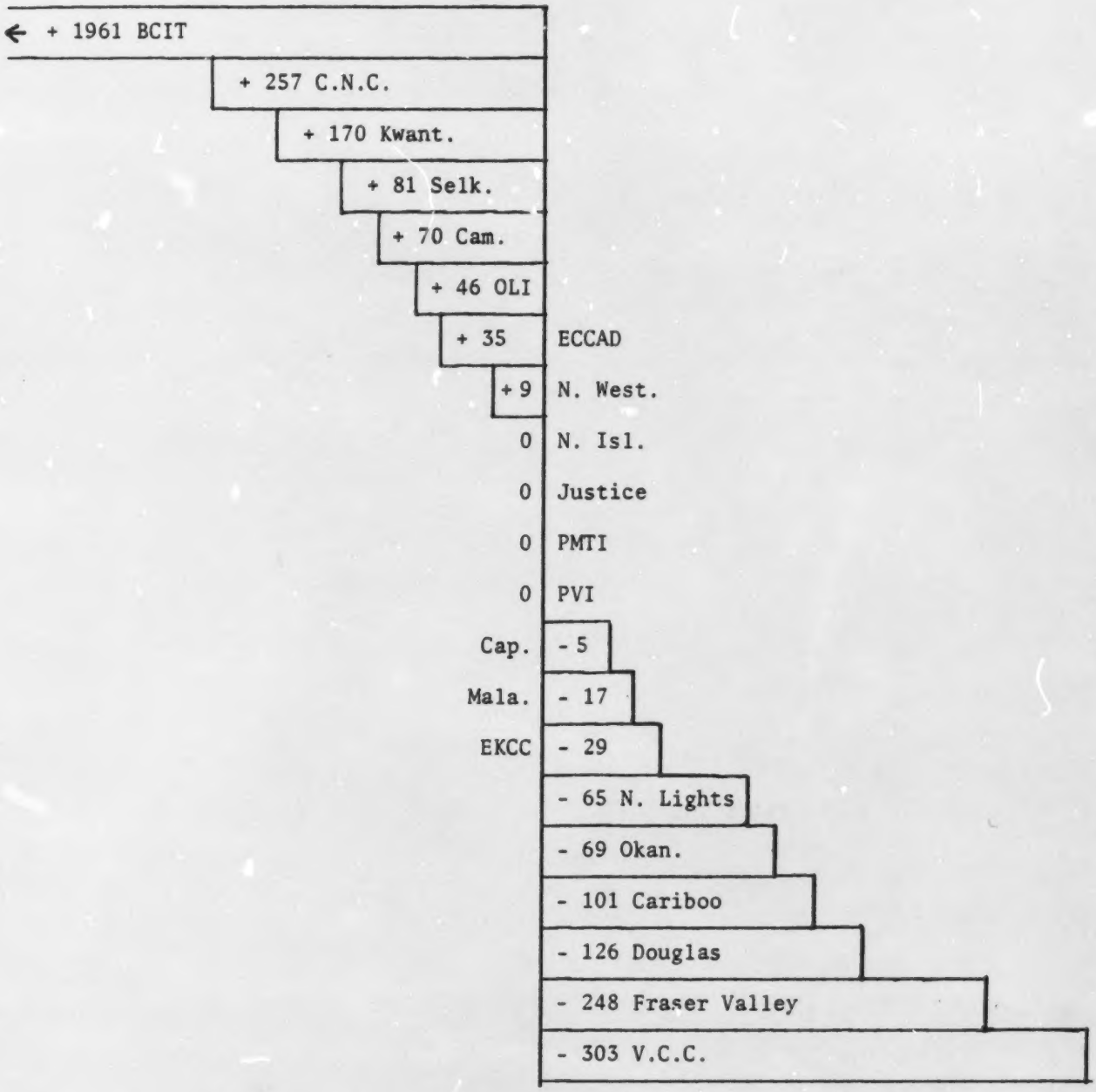


1987/88

Source: B.C. Ministry of Education (see Footnote 4)

CHART 26

Career Technical Program Changes in FTE*
1982/83 to 1987/88



Source: MOE (see Footnote 4)

* Excluding C.E.

D. Cost Comparisons[5]

For the College and Institute system, the mean gross cost per contact hour in 1982/83 increased 0.9% to $6.39/SCH (Table 11). Since the rate of inflation was 9% in 1982/83, the constant dollar cost per SCH actually declined 8.7%. V.C.C. had the lowest cost/SCH in the system, while D.T.U.C. had the highest. BCIT was third highest in cost/SCH at $8.30 with a 4.7% increase in 1982/83. In constant dollars this actually represents a decline of 4.0% (This differs from the MOE calculation of -1.3%, a discrepancy still to be resolved.).

For academic/technical programs, the net cost per SCH for the system increased 0.6% to $4.25/SCH. BCIT's net cost per SCH in academic/technical programs in 1982/83 was $4.68, for a 5% increase over 1981/82. Since technological programs are more expensive to operate, the relatively higher cost/SCH is understandable. Not only does BCIT have by far the greatest number of F.T.E.'s, but also expects to increase this number by almost 2,000 with constant dollars. Furthermore, BCIT provides more SCH in career technical programs than any other institute, totalling almost 30% of SCH in the entire system in 1982/83. For comparative purposes, cost should be equated to product. BCIT's National Diploma of Technology is unique in the provincial system, yet serves more students. It is this combination of quality and quantity which contributes to and justifies the slightly higher unit cost.

E. Technological Programming

Technology-related programs constitute the majority designated as provincial and/or national priorities, particularly in Electronics and Computer Science. New programs in these fields are primarily being supported by the Skills Growth Fund. Since provincial policy requires institutions to use constant dollar figures for their base budgets over the next five years while discouraging new programming, few program increases are expected through conventional MOE funding.

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5 M.O.E., Review of System Trend Student Contact Hours & Cost per Contact Hour 1980/81 to 1982/83, Management Services Division, Post-Secondary Department, REvised Nov. 23, 1983.

TABLE 11

COMPARATIVE COST

DOLLARS PER STUDENT CONTACT HOUR

1982/83

INSTITUTION	GROSS COST/SCH (Ranked)	NET COST/SCH ACADEMIC	NET COST/SCH TECHNICAL
Vancouver Community College	5.18	3.48	
Camosun	5.38	4.12	
Pacific Vocational Institute	5.67		N/A
Kwantlen College	5.68	3.70	
Fraser Valley	5.93	4.40	
Capilano College	6.15	3.52	
Cariboo	6.17	4.02	
Okanagan	6.22	4.07	
Malaspina	6.38	3.87	
New Caledonia	6.41	3.83	
Douglas	7.05	4.39	
Northwest	7.51	7.19	
East Kootenay	7.59	5.28	
Pacfic Marine Training Inst.	7.77		N/A
Emily Carr	8.15	4.54	
Northern Lights	8.29	9.58	
BCIT	8.30	4.68	
Selkirk	9.13	6.31	
David Thompson	15.76	9.15	
System Total	6.39	4.25	

Source: Ministry of Education, Review of System Trends

Kwantlen College, for example, projects a 30% decrease in registrants in the Career/Technical Electronic/Information Processing/Computer provincial priority group by 1987/88. Meanwhile, Kwantlen will be implementing seven new 2-year technological programs supported by the Skills Growth Fund. Two of these programs are in Computer Systems and two in Electrical/Electronics, each with 70 FTE's. The remaining programs are in Industrial, Mechanical and Civil Technology. In total, these seven programs will accomodate 490 new FTE's by 1985/86.

OLI's enlarged mandate as provincial coordinator and provider of distance education includes serving as the primary delivery agent for open technological education. Due to constant dollar budgeting, almost all of the technology-related program changes proposed by OLI fall under the alternative funding scenario. The following summarizes some of these relevant changes proposed by OLI over the next five years:

1. To develop and offer two-year post-diploma degree programs in Technology and in Computing Science;
2. To expand its certificate program in Business to a diploma program;
3. To develop and offer courses in a Process Control Technology program for employees in Process Industries;
4. To develop and offer courses leading to a certificate program in Computer Science;
5. To develop and offer courses in a variety of technologies, such as Forest and Engineering technologies;
6. To offer a post-basic Nursing program;
7. To offer technical courses to meet the needs of Engineering Technologists, in cooperation with BCIT and the BCSET;
8. To offer Power Engineering courses;
9. To offer a Graduate Nurse Refresher program.

Due to MOE imposed funding limitations, V.C.C. anticipates an 11% decrease in career/technical FTE's over the next five years. No new programs are planned, with the exception of Computer Systems Technologist program supported by the Skills Growth Fund. This program, to be implemented in 1984/85 will accomodate 70 FTE's.

Universities are also being effected by budget restraints. In 1981, Simon Fraser University proposed establishing a new Faculty of Engineering, with four departments, enrolling about 825 undergraduates. In reality, SFU's engineering program just admitted 30 undergraduates into its first core. In 1986, a second core is planned to begin. Each core will enrol 30 in year one and each expects to graduate 25. By 1989/90 maximum undergraduate enrollment in engineering should be around 230 students. This is a substantial reduction from the original proposal.

The University of Victoria's planned implementation for its undergraduate program of the Faculty of Engineering may be delayed another year. Funds with which to construct the necessary facility have not yet been forthcoming. So far enrolment projections have not been revised. Electrical Engineering is the first program planned, with an estimated total enrolment of 343 by 1988/89 or 1989/90.

It appears that despite the priority given to technological programs, funds with which to initiate new programs will not be made available by the provincial government. Instead institutions are being advised to either look elsewhere for financial support and/or eliminate existing programs in order to establish new programs.[6] These restraints will make it difficult for post-secondary institutions to produce the skilled manpower necessary for the high technology future.

Conclusions

1. The provincial government has made clear that its committment to restraint applies equally to post-secondary education as to other public services. Institutions will have to increasingly seek other sources of support, particularly in order to pursue new program initiatives.

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6 The Sun, Universities in Crisis, December 17, 1983.

2. The current proposal for formula funding could significantly reduce BCIT's allocation due to higher unit costs. Quality, as an essential component of productivity, should be incorporated as a formula factor. This would promote academic excellence, particularly in priority programs, while controlling unit cost.
3. BCIT is the only institution planning significant increases in enrolment in priority career technical programs over the next five years. Since demand already exceeds capacity in these areas, it is doubtful that the educational needs of the province, particularly in technology-related programs, can be adequately met given the resources available. If further restraints are imposed (i.e. formula funding), the situation could become critical in the near future.

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